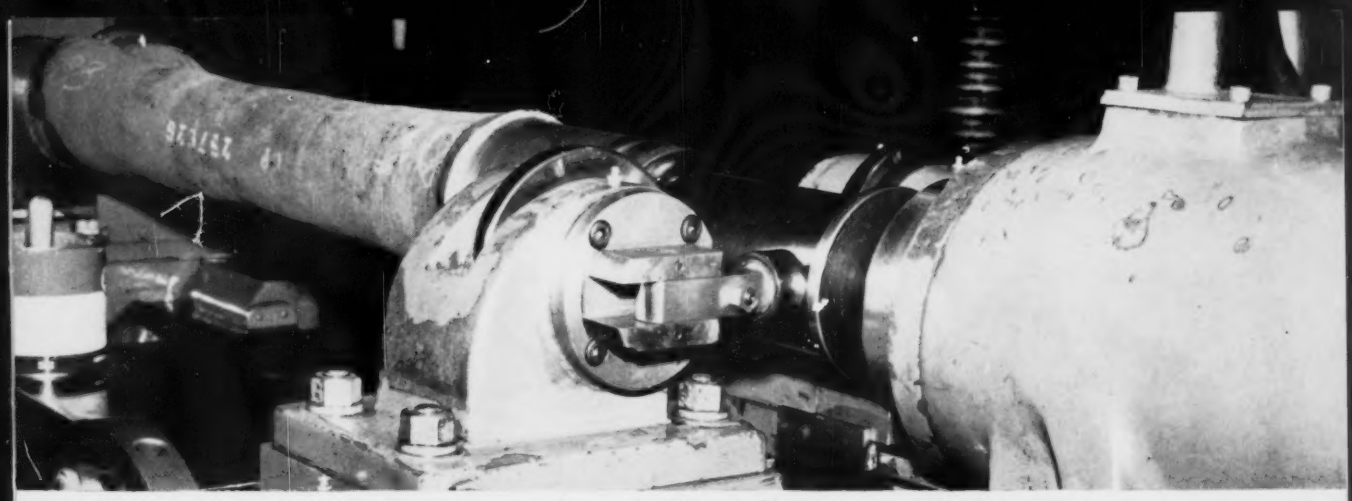


CPR Burnishes Axle Collars . . . . Page 22

RAILWAY

LOCOMOTIVES AND CARS

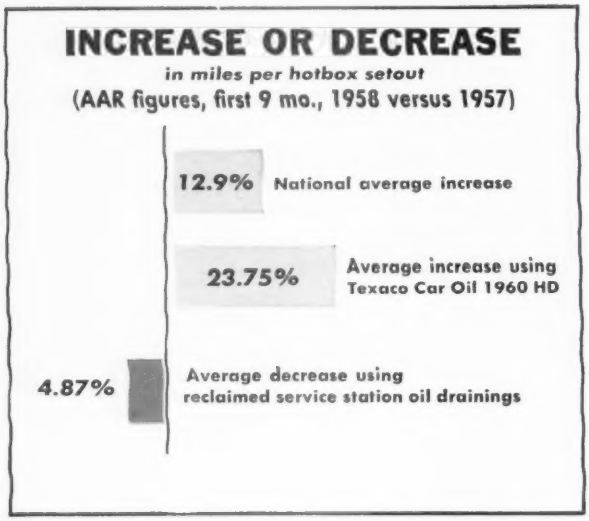
A SIMMONS-BOARDMAN TIME-SAVER PUBLICATION MARCH 1959

Controls for 8500-hp Gas Turbines . . . . Page 44

FOUNDED 1832
AMERICA'S OLDEST TRADE PAPER

Reclaimed service station oil drainings are FALSE ECONOMY in journal-bearing lubrication

• *AAR figures show Texaco premium car oil definitely increases mileage between hotbox setouts*


INCREASE OR DECREASE
in miles per hotbox setout
(AAR figures, first 9 mo., 1958 versus 1957)
12.9%
National average increase
23.75%
Average increase using Texaco Car Oil 1960 HD
4.87%
Average decrease using reclaimed service station oil drainings

AAR figures for the first nine months of 1958 against the first nine months of 1957 show there's no economy in lubricating journal bearings with reclaimed service station oil drainings. Despite a national average *increase* of 12.9% miles per hotbox setout, seven prominent U. S. railroads using reclaimed service station oil drainings 100% for journal-bearing lubrication got a *decrease* of 4.87% miles per setout. Five prominent U. S. railroads using Texaco Car Oil 1960 HD 100% got an average *increase* of 23.75% miles per setout—almost twice the national average.

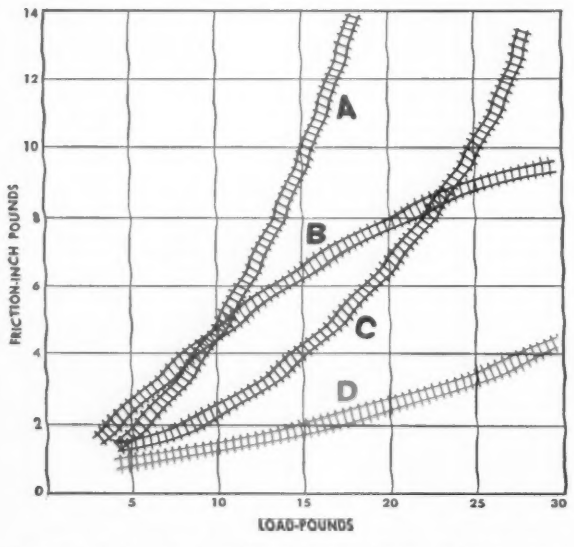
What it can cost—Each hotbox costs about $200, minimum—a lot more where perishable cargo is involved or if a pile-up is caused by derailment. When the apparent savings in the initial cost of reclaimed service station oil drainings are compared with what it costs in extra delays and costly repairs, the savings disappear and there's a big hole in profits.

Two kinds of proof—Actual in-service use proves the economy of lubricating journal bearings with Texaco Car Oil 1960 HD, and there's plenty of scientific evidence to show you why this new Texaco car oil can effectively reduce your hotbox rate.

Get all the facts—Ask your Texaco Railway Lubrication Engineer for a complete report on Texaco Car Oil 1960 HD—and let him show you what it can do for your operation. Or, write:

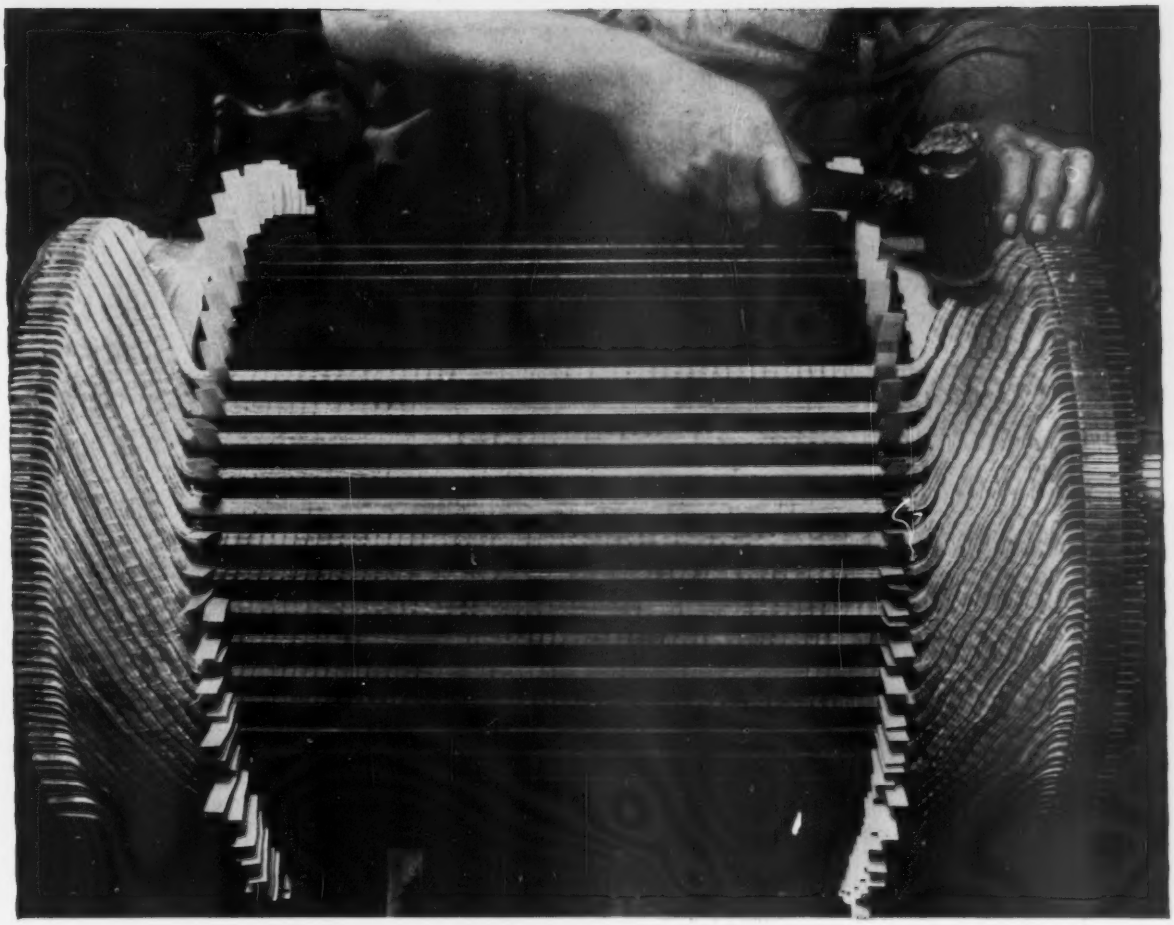
☆ ☆ ☆

The Texas Company, *Railway Sales Division,* 135 East 42nd Street, New York 17, N. Y.



There's less friction throughout the load range with Texaco Car Oil 1960 HD (curve D) than with AAR Car Oil (A) or either of two competitive premium car oils (B and C).

RAILROAD LUBRICANTS AND SYSTEMATIC ENGINEERING SERVICE



NEW NECCOBOND* ARMATURE COIL

adds life to traction motors...cuts rewind time

NECCOBOND is National Electric Coil's name for a new and improved insulation system developed in its own laboratories. Neccobond has been applied to traction armature coils offering these advantages:

Cooler operation, due to rapid heat transfer from void-free insulation.

Greater wear-resistance, due to high mechanical strength.

Excellent moisture resistance, because of complete encapsulation.

Easier, faster winding, due to a high degree of uniformity.

Call in your nearby National Electric Coil field engineer for complete information, then order a trial quantity of Neccobond armature coils. Prove to your own satisfaction that these coils add life to your traction motors... cut rewind time... save money!

***Neccobond** armature coils are insulated with mica and glass, pre-impregnated with a catalytic-type, high temperature resin. Controlled curing then produces an insulating wall with markedly improved characteristics.*

McGRAW EDISON

National Electric Coil

DIVISION OF McGRAW-EDISON COMPANY

COLUMBUS 16, OHIO

ELECTRICAL ENGINEERS • MANUFACTURERS OF ELECTRICAL COILS, INSULATION, LIFTING MAGNETS • REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES

from Callaway Mills–
WIKIT
journal lubricators

....with 4 exclusive features!

● ***Specially Constructed Center Wick***—One-third of the pile fabric is in the center wick. If there is any oil in the box, WIKIT absorbs it!

● ***"Loop Tite" Jacket***—Special construction, woven by a patented process, interlocks loop pile in the weave. Gives greater tensile strength . . . protection against glazing.

● **ABSORBenized®**—WIKIT jackets are specially treated—like famous Callaway bath towels—to assure greatest absorbency, faster wicking.

● **Specially Shaped**—WIKIT lubricates the entire journal . . . is shaped to oil end collar and fillet without exposing main body of lubricator to damage.

WIKIT absorbs and retains 5 pints of oil or more, depending upon size...after saturation and draining 3 hours. Provides continuous lubrication under toughest usage and all weather conditions. Nylon tape secures non-ferrous pull handles to lubricator ends . . . has tensile strength in excess of 500 pounds. Cores are quality neoprene foam . . . resistant to oil, heat, and compression set . . . no metallic parts except pull handles. WIKIT is made for all journal sizes . . . is realistically priced. See your nearest Sales Representative!

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MOTIVES
AND
CARS

The Oldest Trade Paper
In the United States

MARCH 1959—VOL. 133 NO. 3

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BRANCH OFFICES: 79 West Monroe st., Chicago 3; 1081 National Press Bldg., Washington 4, D. C.; 1501 Euclid ave., Cleveland 15; Suite 203, Carlton House, Pittsburgh 19; 214 Terminal Sales Bldg., Portland 5, Ore.; 244 California st., San Francisco 4; 1151 West Sixth st., Los Angeles 17; 3908 Lemmon ave., Dallas 19, Tex.

FOREIGN REPRESENTATIVES: Sibley-Field Publishing Company, Ltd. 8/9 Clerkenwell Green, London E. C. 1, England; Georg J. Linder, Continental European Representative, (16) Frankfurt a. Main, Wittelsbacher Allee 60, West Germany.

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Railway Locomotives and Cars is a member of the Audit Bureau of Circulation (A.B.C.) and is indexed by the Engineering Index Service. Printed in U.S.A.

Published monthly by the Simmons-Boardman Publishing Corporation at Periodical Press Corporation, 3rd & Hunting Park ave., Philadelphia 40. James G. Lyne, Chairman of the Board; Arthur J. McGinnis, President and Treasurer; Fred A. Clark, Vice-Pres. and Sec.; George Dusenbury, Vice-Pres. and Editorial and Promotional Director; M. J. Figa, Director of Production.

•

Circulation Department: R. C. Van Ness, Director of Circulation, 30 Church st., New York 7. Second-class postage paid at the Post Office at Philadelphia, Pa. Subscription price to railroad employees only in U.S. possessions and Canada, $2 one year, $3 two years, payable in advance. Subscription price to railroad employees elsewhere, $8 per year. Single copies, 75¢. Address all subscriptions and correspondence concerning them to: Subscription Department, Railway Locomotives and Cars, Emmett st., Bristol, Conn. Changes of address should reach us three weeks in advance of the next issue date. Send old address with the new, enclosing, if possible, your address label. The Post Office will not forward copies unless you provide extra postage. Duplicate copies cannot be sent.

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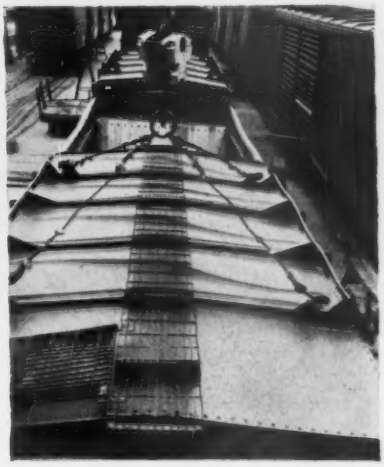
REPORT FOR MARCH

Low roof made this P&LE gondola car different from other "house" cars, according to the railroad, and would be poor spot from which to pass signals.



Sectional roof with running boards is potentially dangerous, P&LE claimed, if the walking surfaces become damaged while mills handle these covers.

Special Gondolas Required To Have Running Boards

Further expansion of the list of car types which can operate without running boards under Safety Appliance laws appears less likely in the light of two recent ICC actions. Denied was a petition by the Northern Pacific to operate drop-bottom gondolas in logging service with some of the drop doors removed and without running boards through the car body.

Previously, an ICC examiner had recommended that the Commission deny a petition by the Pittsburgh & Lake Erie to exempt its covered gondolas from any requirements that they be equipped with longitudinal and transverse running boards. Both the NP and the P&LE petitions were opposed by the Railway Labor Executives Association.

The 150 NP logging cars are "skeletonized" high-side, fixed-end, drop-bottom gondolas with eight of their 16 drop doors removed. Other drop doors are welded shut. This arrangement simplifies the removal of debris from the cars and saves

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TIME SAVING IDEAS FOR MARCH

MOTIVE POWER AND CAR

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Roller bearings keep rolling longer with

NEW GULFCROWN R.R.

Now you can insure extra protection for your investment in roller bearing equipped railroad cars, with a new Gulf grease developed specifically for this purpose.

New Gulfcrown R.R. is a lithium base grease especially formulated for improved lubrication of roller bearing journals. It has been tested and approved under A. A. R. Specification No. M-917-56.

Stands up at high temperatures. New Gulfcrown R.R. has been used successfully in bearings operating at temperatures as high as 250° F.

Pumps freely at low temperatures. Gulfcrown R.R. Grease doesn't become hard or unworkable, even at temperatures as low as 0° F.

Won't thin out at high speeds. Its excellent mechanical stability keeps Gulfcrown R.R. from thinning out under the churning action of high speed bearings.

GREASE!

Resists washing action of water. Gulfcrown R.R. also provides effective protection against rust.

Excellent oxidation stability. New Gulfcrown R.R. Grease is effectively inhibited against oxidation to insure long life, both in storage and in use.

Gulfcrown R.R. Grease is available now in 35 lb. pails, 100 lb. drums and 400 lb. drums. Let us prove that you will get more effective roller bearing protection—and reduced maintenance costs—with this outstanding new grease. Write or phone your nearest Gulf office.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

GULF

GULF MAKES THINGS RUN BETTER!

Special Gondolas

(Continued from page 5)

an estimated $600 per car annually required to keep drop doors in operating condition when cars are in logging service. Most obvious solution, according to an ICC examiner, would be to reinstall the drop doors, the removal of which produced the series of 4½-ft square openings in the car floors.

The P&LE cars have three-section roofs and are used to protect shipments of tin plate and steel bars against corrosion and rust. The Commission report pointed out that other railroads operate similar high-side covered gondolas, except that those cars are equipped with running boards. Examination of two of the P&LE cars by representatives of the Bureau of Safety and Service brought the opinion that they had lost their identity as gondolas and had become "box or other house cars" under the order of March 13, 1911, as amended. "It is not necessary that the Commission promulgate new safety appliance standards to cover the special type cars under consideration, since Part 131.18 is suffi ciently broad to cover this type of special car," the examiner reported. The P&LE pointed out that it has no control over handling of covers during loading, and that running boards could become damaged and dangerous. This condition has been observed on covered gondolas operated by other railroads.

Brake Act Interpretations

Individual railroad interpretations of ICC regulations pertaining to the Power or Train Brake Act of 1958 should be cleared with its Special Committee, the AAR Mechanical Division cautioned recently. Certain roads have posted information pertaining to application of one of the "Red Book" rules which did not receive clearance from the committee and the interpretation might be construed as being inconsistent with the intent of the rules. On June 30, 1958, the Special Committee was formed. Since then, a number of questions have been presented and handled by the committee in accordance with established procedure. A Division spokesman indicated that the system has been working very well, and it is to the interest of the railroad industry to have it continued.

Locomotive Installations in 1958

Class I railroads installed 434 new locomotive units (430 diesel-electric; four gas turbine-electric) in 1958, according to the AAR. In 1957, they installed 1,316 units (1,312 diesel-electric; four electric). New locomotive units on order Jan. 1, 1959, totaled 561, of which 535 were diesel-electric and 26 were gas turbine-electric. On Jan. 1, 1958, Class I railroads had 443 locomotive units on order, of which 413 were diesel-elctric and 30 were gas turbine-electric.

Orders and Inquiries for New Equipment

Placed Since the Closing of the February Issue

Diesel-Electric Locomotives

Road and builder	No. of units	Horse-power	Service	Other detail
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC:				
Electro-Motive	52	1,750	Road switchers.	Total cost over $8,500,000. These GP-9's to replace like number 1941-45 FT units to be turned back to EMD on sale-and-purchase arrangement.

Freight-Car Orders

Road and builder	No. of cars	Type of car	Cap., tons	Length, ft-in.	Other detail
ATCHISON, TOPEKA & SANTA FE:					
General American	50	Covered hopper	70	—	Cost approx. $12,500 each.
Pullman-Standard	50	Covered hopper	70	—	Cost approx. $12,000 each. 100 cars, to be equipped with roller bearings, for delivery first half 1959.
CHICAGO & NORTH WESTERN:					
Pacific Car & Foundry	50	Insulated box	—	50.0	100 cars in this order being delivered.
	50	Insulated box	—	40.0	
General American	50	Covered Hopper	70	—	Airslide. Previously under lease.
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC:					
Strick Trailers	13	Flat cars	—	—	Flexi-Van equipment.
DENVER & RIO GRANDE WESTERN:					
Bethlehem Steel	100	Flat	50	53-6	Cost, $9,000 each. Delivery March July.
Pullman-Standard	28	Triple covered hopper	70	—	Cost, $10,875 each. To have been delivered about March 1.
	9	Piggyback flats	70	85-0	Cost, $15,350 each. To have been delivered March 1.
Pacific Car & Fdry.	115	Insulated box	50	50-1	With nine-belt car-pack damage-free loaders. Cost, $14,095 each. Delivery, August and September.
DETROIT, TOLEDO & IRONTON:					
Greenville Steel Car	200	Hopper	70	—	Three pocket type. Cost, approx. $1,750,000. April-May delivery.
LAKE SUPERIOR & ISHPEMING:					
Bethlehem Steel	200	Ore	70	—	Cost approx. $9,400 each. April-May delivery.
MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE:					
Company shops	100	Box	50	—	——
	25	Covered hopper	70	—	——
		Gondolas	70	—	——
	50	Flat	70	—	——
	25				
NEW YORK CENTRAL:					
Despatch shops	1,000	Hopper	—	—	Deliveries expected to be completed in the fall. Approx. cost, $8,700,000.
PITTSBURGH & LAKE ERIE:					
Despatch shops	500	Hopper	70	—	Self-clearing type. Cost, $4,000,000. Delivery: first half 1959.
RUTLAND:					
International Ry. Car	2	Cabooses	—	—	Cost, $18,400 each. Delivery: August.

Notes and Inquiries

FREIGHT CARS:

Chicago, Burlington & Quincy will repair approximately 4,700 freight cars at its Havelock, Neb., shops in 1959. Major part of $7,500,000 heavy repair program involves complete overhauling of 2,500 box cars.

Georgia & Florida receiver seeking loans totaling $2,000,000 in applications filed with ICC under provisions of 1958 Transportaton Act, half to be used for purchase of 100 box cars.

Illinois Central will spend approximately $6,148,000 on its 1959 car repair program. Shops at Centralia, Ill., and McComb, Miss., will repair 5,680 freight cars at a cost of $3,615,000.

St. Louis-Southwestern has ordered 100 insulated box cars with special loading equipment and Hydra-Cushion underframes.

Southern Pacific will acquire 1,400 new freight cars in 1959 as major part of $22,000,000 equipment program. 100 will be 85-ft piggyback flat cars (RL&C, December, p8). Also on order are 500 wide-door box cars, suitable for mechanical loading of lumber and plywood, due off assembly lines beginning in April; 800 insulated box cars with special loading equipment and Hydra-Cushion underframes to begin arriving in July.

PASSENGER CARS:

Illinois Central will repair at its Burnside shops, Chicago, 59 main-line passenger cars and 210 commuter coaches at a cost of $2,533,000.

Southern Pacific is acquiring 50 lightweight passenger cars to be used primarily for mail, baggage and express.

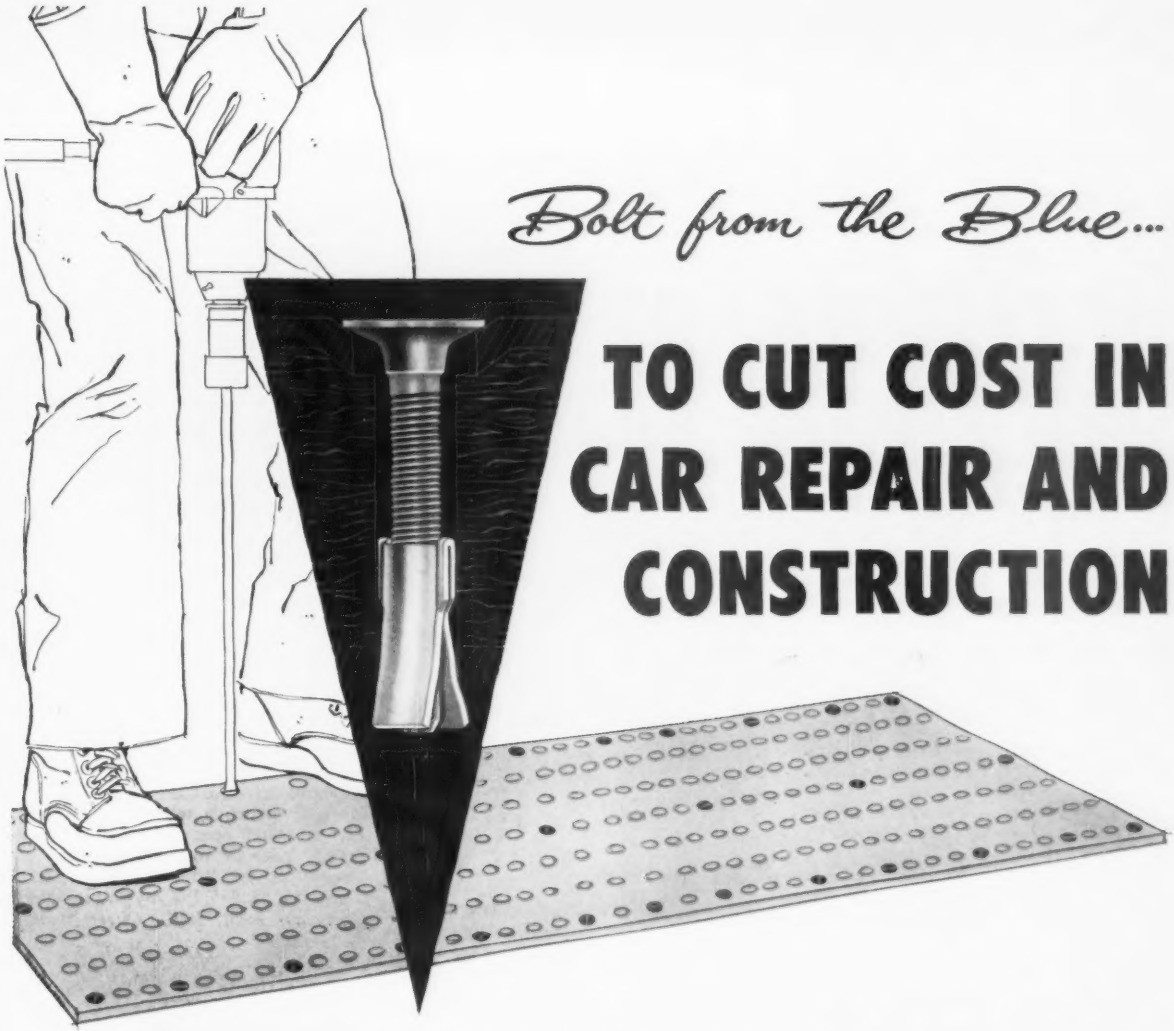
Shop Improvement Programs

The Denver & Rio Grande Western improvements program for 1959 includes the expenditure of $1,142,000 for improvements at its Burnham, Pueblo, and Roper Yard shops.

The *Reading* is replacing its fire-destroyed locomotive and car repair shop at Newberry Junction, Williamsport, Pa., with a new prefabricated steel diesel locomotive repair shop.

The *Southern Pacific* will construct a heavy repair shop at Tucson, Ariz., for Pacific Fruit Express refrigerator cars. The cost is estimated at $840,000. A PFE shop for repairing mechanical refrigeration units is also being built at the Tucson shop.

(Turn to page 51)



Bolt from the Blue...

TO CUT COST IN CAR REPAIR AND CONSTRUCTION

NEW Empeco SELF LOCKING SLEEVE BOLTS

- One-man installation in wood-to-steel, or steel-to-wood applications; no need for second man to "hold" nut.
- Cheaper, faster, easier installation for blind and hard-to-get-at jobs.
- Vibration-proof, rust-proof, permanent installation.
- Lowest cost installation; highest quality manufacture.
- Proved in use on leading railroads.

New EMPECO Self Locking Sleeve Bolt, with standard carriage bolt head, is inserted as single unit. As bolt is tightened into anchored nut, sleeves of nut open and lock in permanent bull dog grip. As added economy, EMPECO Bolts can be re-used.

For complete information and literature on new economies possible with EMPECO Self Locking Sleeve Bolts, in any wood-to-steel, or steel-to-wood installation, please write:

Empeco

ESSENTIAL MECHANICAL PRODUCTS & EQUIPMENT COMPANY

Empeco 1400 East Tremont Street, Hillsboro, Illinois

NATIONAL SALES REPRESENTATIVE: John R. McGrath, 156 Hawthorne Street, Elmhurst, Illinois

Composite Journal-Box Lid

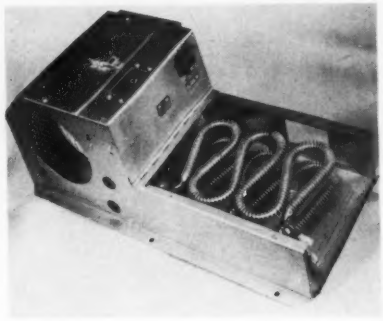
The Flexo 5 composite journal-box lid is fully articulated for use either on integral or separable journal boxes. It has a malleable cast-iron hood and a flanged, reinforced pressed-steel cover.

A torsion type roller spring within the hood casting applies constant pressure on the pressed-steel cover which is joined to the housing at the center with a ball and socket joint. The full four-way articulation provided by this assembly permits lids to self adjust and compensate for hinge-pin year and variations on the journal-box face. No special tools are needed for installation or removal.

The lid has been approved and certified by the AAR. *Motor Wheel Corporation, Dept. RLC, Lansing, Mich.*

Epoxi-Mica Insulation System

Vacuum and pressure impregnation of wound armatures up to 1,000 hp is now being done with the Epoxi-Mica insulation system. Tests conducted on a 400-hp single-phase a-c semi-closed slots armature, which was immersed in water for six days, show an insulation resistance of 10,000 megs at 2,500 volts. This, the manufacturer believes, is the first piece of equipment of this size to be made waterproof with one vacuum pressure impregnation. The insulation combines natural mica splittings and solventless Epoxy resin through a vacuum pressure impregnation process. The impregnated wall is cured under pressure, resulting in a void-free, high dielectric, consolidated insulation. Problems previously experienced with conventional insulations are said to have been completely eliminated. *Motor Coils Manufacturing Company, Dept. RLC, Pittsburgh, Pa.*



Cab Heater

The Modulectric cab heater is designed for use as a booster heater to supplement standard hot-water heaters on diesel switchers and road locomotives and to heat cabs on RDC cars. It has 4-kw heating capacity in two steps of 2 kw each and provision for attaching a defrosting unit. During summer months, the fan alone can be operated to remove fog and mist from cab windows.

Three switches on the heater give simple positive control. The fan operates off the main power switch. The other two switches each control two kilowatts of heat capacity.

The circulating fan exhausts warm air at floor level. Overheat protection automatically shuts off the heating coils should circulating fan fail.

The unit is 22⅜ in. long, 8¾ in. deep, and 10½ in. wide and operates on 74 volts d-c. *Vapor Heating Corporation, Dept. RLC, 80 East Jackson Boulevard, Chicago 4.*

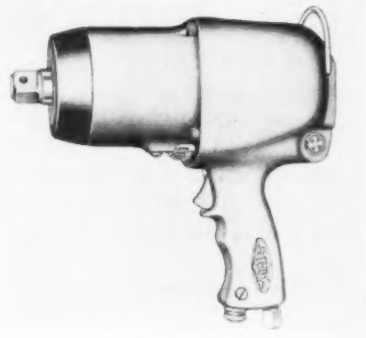
Valve Seat Grinder

The Model EDP eccentric valve seat grinder will handle all diesel-engine valve seats ranging in diameter from 1½ in. to 7 in. Valve seats can be narrowed at the top, or at the "choke" without jamming and breaking the wheel, or without the use of extra cutters or special tools. By using the improved micrometer feed screw complete control of the grinder is had at all times, and the valve seat can be ground to a finished condition within .001 in. runout the first time without constantly removing the grinder from the seat to check progress. *Hall-Toledo, Inc., Dept. RLC, 2931 South avenue, Toledo 9, Ohio.*

Air Motors for Heavy Duty Service

A new line of Joy Pistonair five-cylinder, radial air motors for heavy duty service have horsepower rating from 11½ to 20 at 90 psi. Direct drive models turn at 400 to 800 rpm at rated horsepower with stall torques from 225 to 162 ft-lb. They are available NEMA D flanged, making them interchangeable with electric motors having 254UD and 256UD, or 284UD and 286UD frame sizes; flanged with 15-in. diameter bolt circle, and foot mounted. Weights are from 230 to 289 lb.

Geared-drive foot-mounted models have five gear reduction ratios from 4.1 : 1 to 21.5 : 1. Shaft output at rated horsepower ranges from 19 to 200 rpm, with stall torques of 4,837 to 648 ft-lb. Weights from 485 to 495 lb. *Joy Manufacturing Company, Dept. RLC. Oliver Building, Pittsburgh 22.*



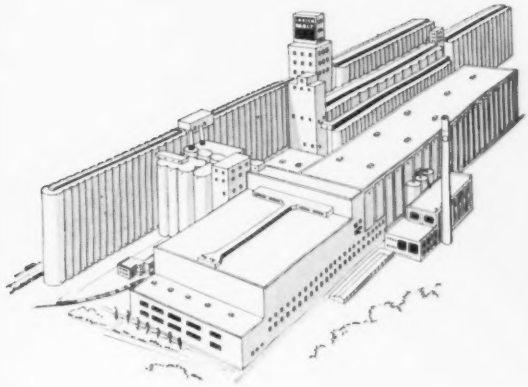
Air Impact Wrench

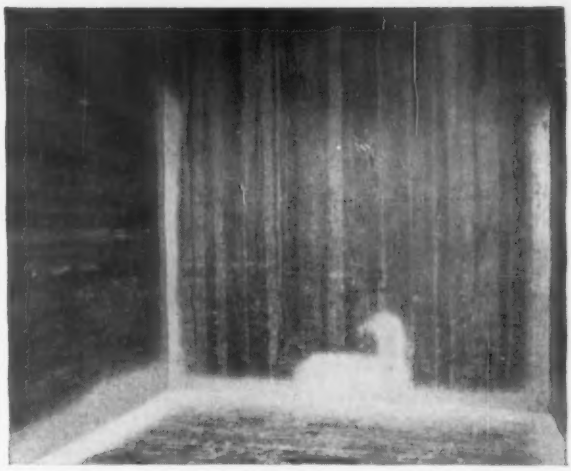
The Sioux ¾-in., Model No. 320, air-impact wrench is one of seven new models of air impact wrenches and air screwdrivers. It has 90 lb air pressure and is rated at 700 ft-lb of torque, which is said to be an outstanding torque rating for the size of wrench.

Smallest of the new wrenches is the production type No. 313 and 314. It

(Continued on page 54)

Why Ladish Malting Co. Requests Malt Cars Relined With ADM Freight Liner 810





Corners are easy to repair with Freight Liner 810. It dries in minutes to provide quick, economical repairs. Any crew can be trained to do the job with brief instruction.

After corners and ends are tightly sealed with plastic and fiberglass contaminated or stained areas on floors can be quickly covered with a single coat of Freight Liner 810 plastic.

Ladish Malting Co., one of the nation's largest maltsters, ships bulk malt to leading brewers across the country. The malt goes straight from the box cars to the brew kettles. That's why their cars must be of the very highest grade.

After years of experimenting with various methods of relining car interiors, Ladish now requests that railroads furnish boxcars relined with ADM Freight Liner 810. The plastic and fiberglass used in Freight Liner furnishes a tight, sanitary, smooth interior which assures arrival of the malt in perfect condition at the brewery.

The Chicago and Northwestern Railroad, which furnishes the cars Ladish needs each day, uses Freight Liner for sidewall and end patching, and for resurfacing stained floors. A special, inexpensive spray gun is connected to the cleaning track's compressed air line. The areas to be repaired are sprayed with Freight Liner 810 from a one gallon can. Then fiberglass cloth is applied, followed by a final coat of the plastic. Relining is simple, inexpensive, and can be done year around.

Ladish likes the consistently satisfactory results which the ADM Freight Liner System produces, and even keeps a supply of the material at their plant for supplemental repairs and touch up jobs.

The ADM Freight Liner System is manufactured and sold by Archer-Daniels-Midland Co. For further information regarding this proven system of repairing car lining for high class commodities, write, wire, or phone (FEderal 3-2112) ADM Freight Liner System, Archer-Daniels-Midland Co., 732 Investors Building, Minneapolis 2, Minnesota.

Archer-Daniels-Midland

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OTHER ADM PRODUCTS: Linseed, Soybean and Marine Oils, Paint Vehicles, Synthetic and Natural Resins, Vinyl Plasticizers, Fatty Acids and Alcohols, Hydrogenated Glycerides, Sperm Oil, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa, Livestock and Poultry Feeds.

How you can plan right now to

SAVE $288,

A practical "Roller Freight" plan

The railroads will save an estimated $288,000,000 a year in operating and maintenance costs—or $144 per car—when all freight cars are "Roller Freight" . . . roll on roller bearings. They'll have modern rolling stock to give even more dependable service, get more shipping. And here's a practical plan, ready now.

Why not get together with other railroads and *plan* your roller bearing purchases. Order a specified number each year. That gives you an equitable proportion of "Roller Freight" cars yearly. Sharing them in interchange will speed the day when all railroads will get full benefits. And earn a good return while doing it.

This plan helps the railroads two ways. 1) By putting cars on roller bearings regularly they'll keep bearing costs at a minimum. 2) They can set up economical shop schedules for conversion to roller bearings, further reducing costs.

Revolutionary plant makes "Roller Freight" even more practical

The Timken Company's new, highly mechanized railroad roller bearing plant (partial view right) makes this savings plan possible. It can turn out 20,000 car-sets of Timken® "AP" heavy-duty roller bearing assemblies a year. (See view below, right).

The costs of friction bearings and other things railroads buy have climbed rapidly. But the cost of the Timken bearings for freight car applications is less than it was 10 years ago! Planned, regular purchases to keep this new plant in production will help *keep* bearing costs down.

Already 76 railroads and other car owners have over 27,426 freight cars on Timken tapered roller bearings. As they put more new and older cars on Timken bearings, the savings will mount. Why not plan your "Roller Freight" program now—start your savings rolling? The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

PROOF OF PERFORMANCE . . .

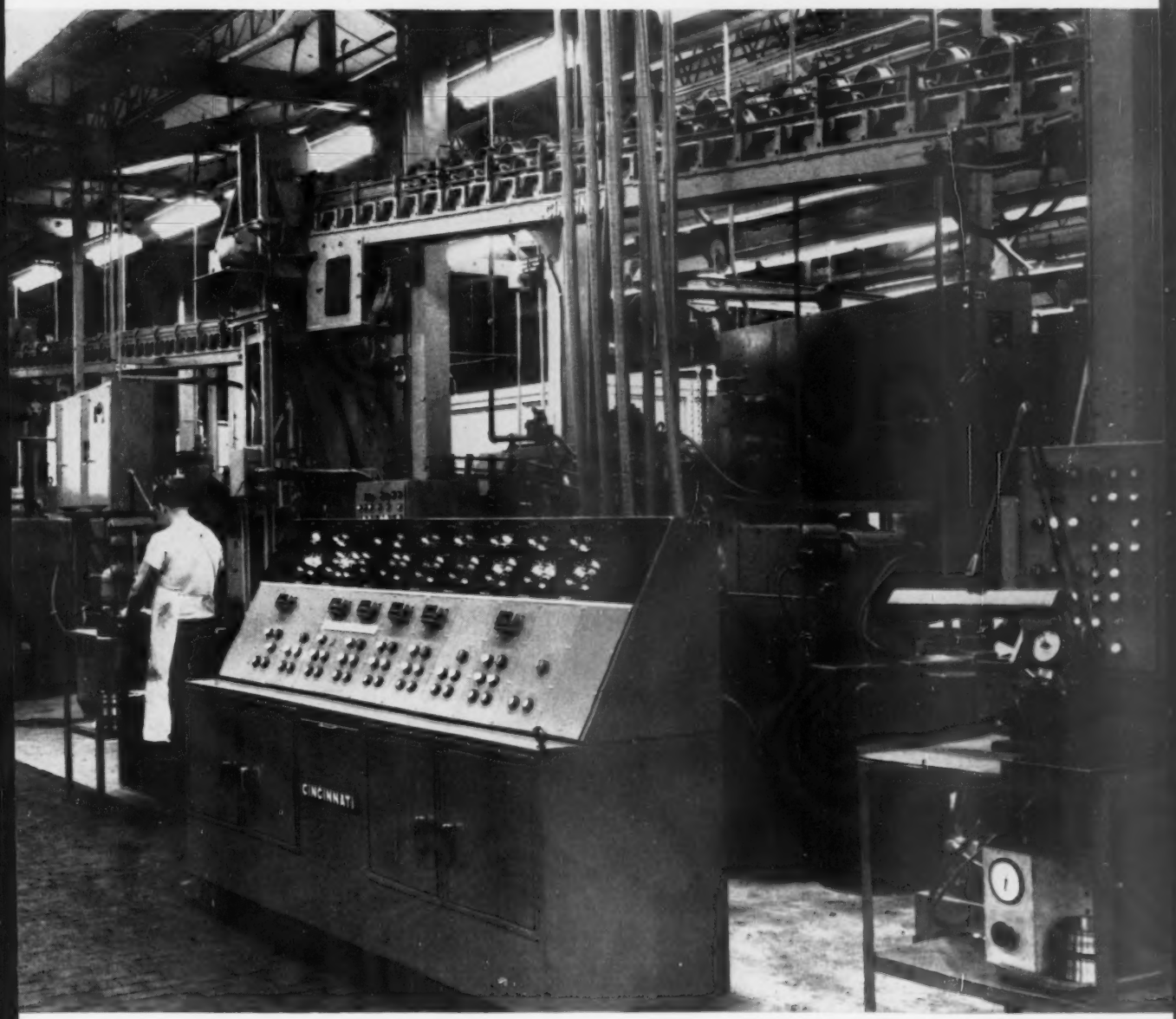
One railroad's freight cars equipped with Timken roller bearings rolled over 300,000,000 car-miles with only *one* overheated bearing.

*The **taper** makes Timken the only journal bearing that delivers maximum economies.*

BETTER-NESS rolls on TIMKEN®

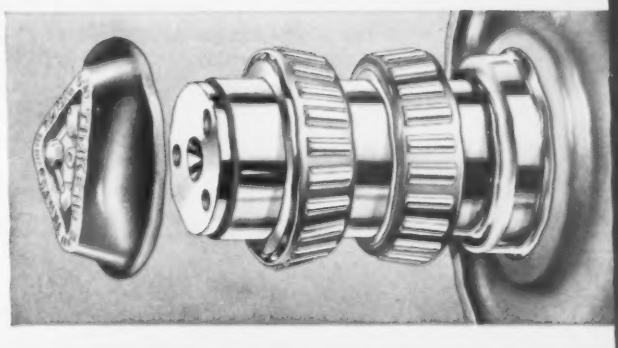
go "Roller Freight" at low cost

000,000 A YEAR



tapered roller bearings

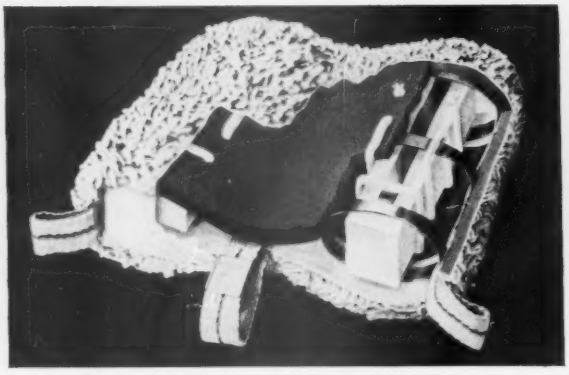
First in bearings for 60 years



NOW MAGNUS OFFERS THE PRACTICAL SOLUTION

to the freight car HOT BOX PROBLEM

Magnus Lubricator Pads and R-S Journal Stops give two-way protection against all major causes of road setouts due to bearings— provide the bearing performance railroads WANT, at a cost they can AFFORD TO PAY—RIGHT NOW!

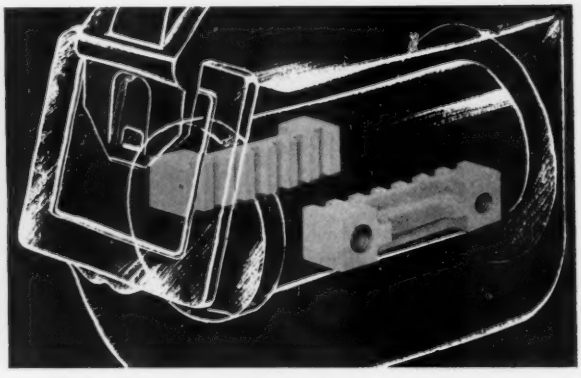


MAGNUS LUBRICATOR PADS

wick more oil, hold more oil, provide uninterrupted journal lubrication

Use Magnus Lubricator Pads to deliver the maximum amount of oil to the journal from an abundant oil supply. There's 3-way wicking—circumferential, internal and center-feed—and each pad holds 2.5 times its own weight in oil—better than 5.9 pints for the 6"x 11" size.

Rugged one-piece twin-lobe construction assures long life. Thoroughly tested internal springs provide *maximum and constant* resilience—pads just can't lose contact with journal during their useful life. The cover is heavy pre-shrunk duck, tufted with quality cotton yarn and backed by high-capillarity felt. In all, it's a lubricator pad designed by bearing experts to give you the performance you want and need.



MAGNUS R-S JOURNAL STOPS

stabilize the whole bearing assembly— double bearing life, cut hot boxes 90%

With R-S Journal Stops you keep the bearing in proper position at all times—restrict fore-and-aft movement of the axle to 3/32" in either direction. That prevents dust guard damage, lets oil seals work. You increase miles per hot box ten times, *miles per cut journal* fifteen times. You reduce wheel flange wear, cut truck maintenance costs all along the line.

Initial cost is low—less than 2% of new car cost—and you get that back in less than 3 years. That's why R-S Journal Stops are your best bet for better bearing performance.

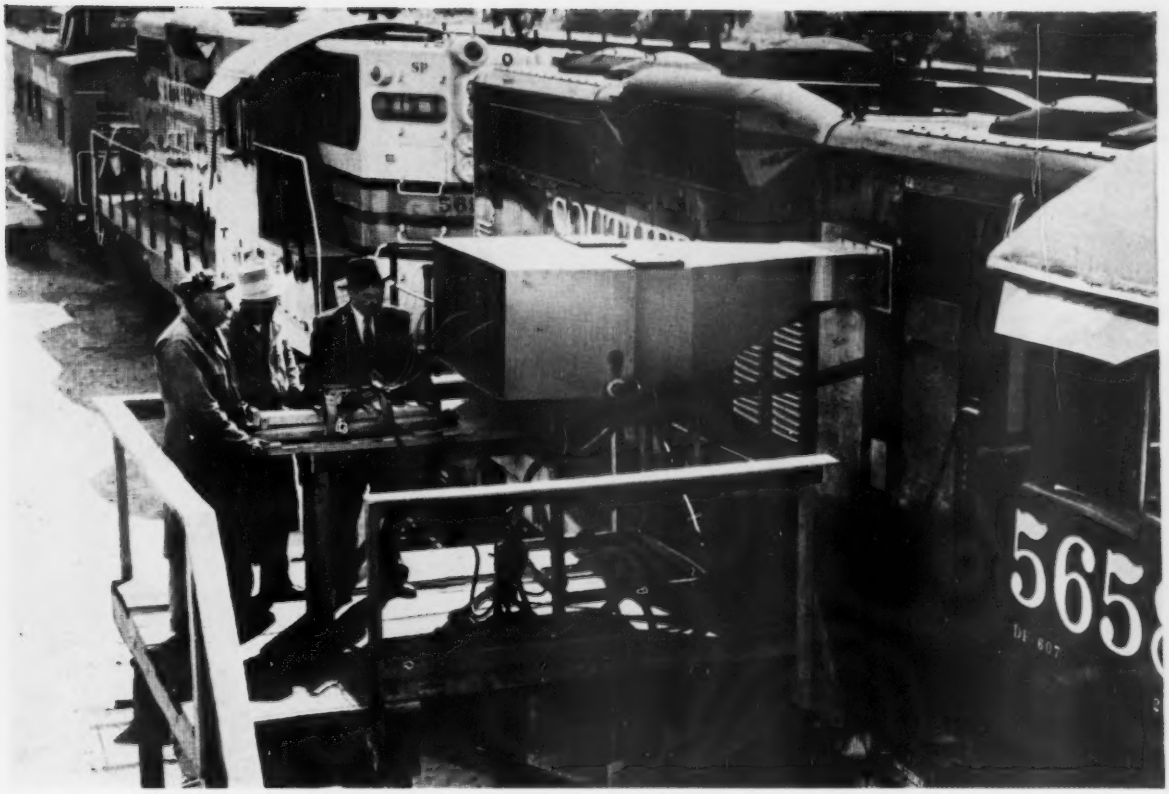
For complete information on R-S Journal Stops and Magnus Lubricator Pads write to Magnus Metal Corporation, 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 4.

MAGNUS

SOLID BEARINGS
R-S JOURNAL STOPS
LUBRICATOR PADS

GEARED TO PROGRESS
RPI MEMBER

MAGNUS METAL CORPORATION *Subsidiary of* **NATIONAL LEAD COMPANY**



Two GP-9's were used for the experiments. Test site was at San Francisco initially, but work has now been transferred to Roseville, Cal.

Radioactivity Measures Engine Wear

SP evaluates fuels, lubricants, and filters by measuring wear of radioactive piston rings

RADIOACTIVE TRACER techniques are providing an excellent accelerated method for the Southern Pacific to test the influence of various factors on the wear in locomotive diesel engines. Activated piston rings are being used for the evaluation of fuel characteristics, lubricating oil properties, air cleaners, engine conditions, parts metallurgy and other factors directly affecting wear in the ring belt area. Similar techniques could be used in evaluating wear in other parts of the engine where metallurgy and size permits irradiation in a nuclear reactor.

With proper monitoring and safety supervision, radioactive piston ring tests are being conducted safely and well within the prescribed tolerances of the Atomic Energy Commission and other regulatory bodies.

The Southern Pacific was a pioneer in the general use of "economy" and of light residual fuel in railroad diesel engines. Its first locomotive using residual fuel was operated in 1955. Economy distillates differ from regular fuels in that they frequently contain cracked stocks and generally are characterized by lower cetane rating and poorer stability. Residuals fuels contain undistilled components and are characterized by their black color, high viscosity, high carbon residue and their inability to achieve complete distillation at atmospheric pressure.

Fuel comprises more than 50 per cent of the cost of operating a diesel locomotive. In an effort to reduce operating expenses, SP research has been directed toward the utilization of less costly fuels in diesel locomotives. The Southern Pacific now has equipped 140 diesel units in regular freight service with a two-fuel system automatically using economy distillate at idle reduced loads, and light residual fuel at high loads. (RL&C, Nov. 1956, page 55). The use of the

economy distillates and light residuals resulted in fuel cost savings, but some of these were expended in increased engine maintenance. Although wear is responsible for a large part of engine maintenance costs, little data has been available on the factors which cause this wear.

The purpose of Southern Pacific Mechanical Research Project RMS-33 was to study piston ring wear as influenced by the following: (1) operating conditions; (2) selection of engine parts; (3) fuels, and (4) lubricants. During the planning of the program, it was decided to adapt the radioactive tracer technique for evaluation of compression ring wear. If it proved successful in railroad diesels, a large number of variables could be studied in a relatively short time at a nominal cost. Obtaining wear information by conventional means was far too costly from the standpoints of time, manpower and parts required.

A minimum of a year is required to obtain wear data in railroad diesel engines by conventional methods where new or clean pistons, compression rings, liners, thrust washers, wrist pins, and bearings, carefully weighed and measured, are installed in the engine. After a specified time, these measured parts are removed, cleaned, and re-measured to determine the engine wear.

The conventional method has the following disadvantages:

- It is slow and expensive; time is required to accumulate the required test hours and assemble, disassemble and measure the test parts.
- The results obtained are influenced by the surface finish of the parts used, differences in metallurgy of the test parts and the possibility that the engine assemblies were not identical in different test units.
- Operating conditions, such as position of the test unit in the consist and load factor, will influence the test result.
- Maintenance practices will influence the results. It is unlikely that the same crew will perform the work on each of the test units, and the character of maintenance will vary between crews.
- The conventional method of wear testing cannot be used to study transient effects.

The conventional method of engine wear testing has the following advantages:

- Wear of any moving part can be obtained.
- Engine deposition data are obtained.
- Endurance of the critical engine parts is determined.
- Performance of the fuel and lubricant in service is established.

Radioactive Testing

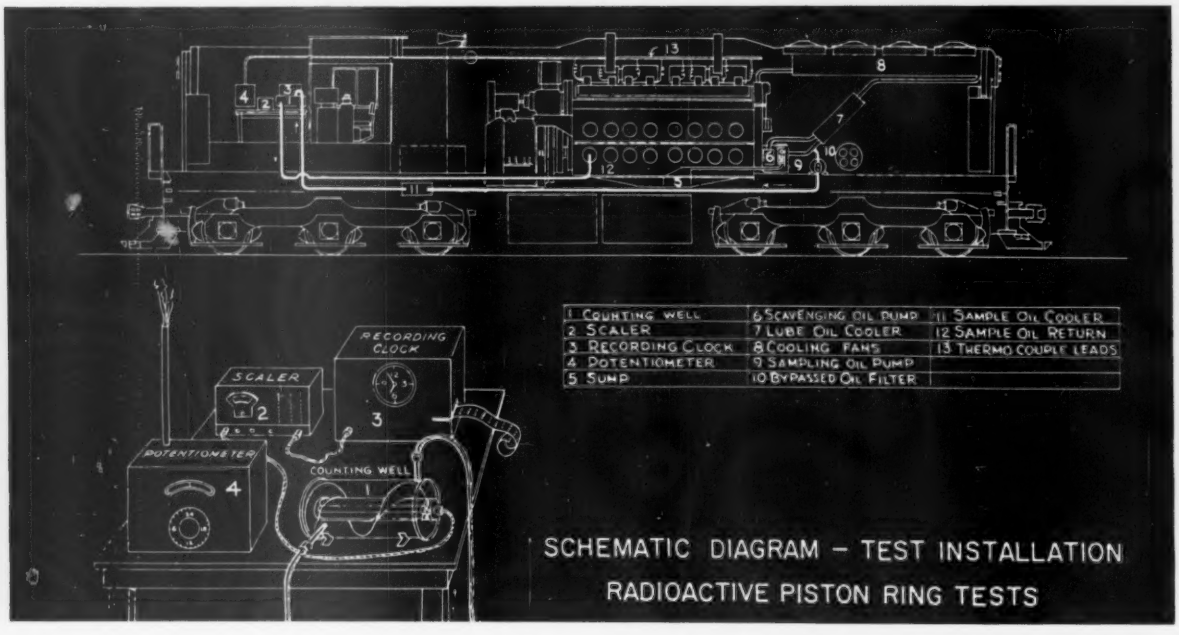
The technique using radioactive piston rings measures engine wear by determining with Geiger Muller detectors or tubes, the quantity of radioactive iron worn from the rings and washed into the lubricating oil. The accumulation of radioactive counts is automatically timed by a recording clock. The data, processed in an electronic computer, tells the rate of increase of radioactivity in the lubricating oil. This is proportional to the rate of engine wear. The disadvantages of using this method are:

- Fatigue failures of test parts cannot be determined.
- Aging of the lubricant and its properties during aging in service cannot be established.

The advantages of the radioactive technique are as follows:

- The speed with which one variable can be compared with another with respect to wear. The wear rate for a given set of conditions can be established in six to eight hours.
- More reliable data can be obtained because variables can be isolated and evaluated.
- Because the tests are short, it is feasible to make multiple runs to obtain precise data on variables of particular interest.
- Transient effects can be studied.

Standard piston rings were irradiated in a nuclear reactor. Two U.S. reactors have openings of sufficient size to permit irradiation of the rings used in these tests. One is at the Argonne National Laboratories in Lemont, Ill., and the other at the Brookhaven National Laboratories on Long Island, N.Y. During the course of their irradiation in the nuclear reactor,



SCHEMATIC DIAGRAM – TEST INSTALLATION
RADIOACTIVE PISTON RING TESTS

Extension handles on ring expander made it safer for men who applied radioactive rings.

Application of radioactive ring, installation of piston and head took 5 min for each assembly.

Radiation monitoring of assembly operation and subsequent testing showed no excess exposure.

a portion of the Iron-58 atoms in the piston rings absorb neutrons and are thereby changed to atoms of the heavier isotope Iron-59. The distribution of this radioactive iron isotope is uniform throughout the piston ring. In an effort to revert to a stable arrangement in the nucleus, the radioisotope Iron-59 emits gamma and beta radiation spontaneously and at a rate independent of temperature and of any physical or chemical treatment to which the metal may be subjected. The gamma rays activate the Geiger Muller tubes which detect minute quantities of radioactive iron. In counting arrangements used in these tests, beta rays are not detected because they are easily stopped by the steel tube which houses the Geiger tubes.

Iron-59 decays with a half life of 45 days. This means, that if originally you had one microgram of radioactive iron, 45 days from this time you would have only half a microgram; and in another 45 days, a quarter of a microgram, and so on. The actual measured decay rate for the rings used in these tests was 48 days for the first two half lives. After approximately two half lives, the measured decay rate deviated because of the alloying components present in the piston rings which form radioisotopes having longer half lives than Iron-59. The principal radioisotope involved is Cobalt 60 which has a half life of five years.

Test Procedure

Two GP-9 locomotive units with EMD Model 16-567-C engines were used for these stationary tests, at the Southern Pacific Bayshore shops in San Francisco. Power developed by the test locomotives was dissipated through the dynamic brake grids. Thermocouples were installed in each of the exhaust risers and at suitable points on the engine to measure the temperature of each exhaust, the water to and out of the engine, lubricating oil to the oil cooler and counting well, fuel in and out of the engine header, the air to the engine filters and ambient temperatures. Fuel consumption was obtained with a differential fuel flow meter.

The lubricating oil filter was bypassed by connecting the discharge of the lubricating oil scavenge pump to the inlet of the lubricating oil cooler. The lubricating oil was continuously sampled at the rate of 10 gpm between the oil cooler and oil strainer housing. This sample of lubricating oil was pumped through a counting well and returned to the engine through No. 8 crankcase cover.

The irradiated rings were installed in the second compression ring groove because other researchers reported better reproducibility when irradiated rings were placed in the second ring groove as compared to the top groove in General Motors 71 series diesel engines. The gamma rays from the radioactive iron carried in the lubricating oil are detected by four Geiger Muller detectors or tubes in the center of the counting well. The Geiger tube counts are registered on a decimal scaler which is connected to a printing clock. The clock automatically records on a tape each 10,000 counts on the scaler to the nearest 1/100 of a minute. Data from the printing clock goes to a Datatron electronic computer which calculates the rate of increase of radioactivity in the lubricating oil, degree of correlation, and other desired computations.

The specific activity of the irradiated rings was obtained from a small portion of the iron filed from the back of the irradiated rings prior to their installation in the engine. A weighed portion of these iron filings was dissolved in hydrochloric acid and diluted to the volume of the counting well. At periodic intervals the activity in counts per second of the solution was measured using a counting chamber of the same size and geometry as used on the locomotive.

The lubricating oil in the test engines was changed and replaced with fresh lubricating oil at the end of each test run. In changing the lubricating oil, the used oil at the end of each test run was pumped to calibrated measuring tanks. This provided an accurate measurement of oil consumption. The same lubricating oil transfer pump was used in conjunction with a meter to fill the engine crankcase with 150 gal of oil required at the start of each run.

The lubricating oil removed from the engine was pumped into a tank car and stored until it had decayed sufficiently to be used without hazard. The lubricating oil, fresh and used, and the various fuels used in the test were stored in the tank cars at the test site.

Safety Precautions

When the irradiated rings were installed, they were never touched by hand, but handled with long sets of tongs and a ring-expander with extensions. Assembly and disassembly of the power assemblies were carefully planned so that the work was accomplished with a minimum of time. Two radiation exposure meters, one worn on the chest and the other on the wrist, were assigned to all personnel who worked with the power

assemblies. The irradiated rings were installed in the power assemblies at the California Research Corporation laboratories at Richmond, Cal., and were transported in the back of a flat bed truck to the test site.

Initially, only four irradiated rings were installed in Locomotive 5658. It was found that the engine itself afforded considerable shielding and, based upon experience, it was found that nine rings could be safely used in the test locomotive. In subsequent installations on Locomotives 5658 and 5694, nine rings were installed. When the rings were installed, an irradiation survey was made at various points on and around the locomotives.

All persons working on these test projects were required to wear a radiation exposure meter or dosimeter, which measures and totals the amount of radiation received. The individual readings were recorded in a bound notebook for each period of exposure.

In seven months of testing, no one has accumulated the maximum exposure limit of 100 milliroentgens, the allowable dosage for one individual for one week.

Test Results

To establish the reliability of the test method, the first set of rings installed in Locomotive 5658 was weighed prior to irradiation at the Argonne National Laboratories. A material balance was made with the actual weight loss determined with a precision scale against the calculated weight loss by radioactive means. In making this material balance, an assumption was made that the lubricating oil burned contained the same radioactive iron concentration as the oil in the lubricating oil sump at the time the oil was burned.

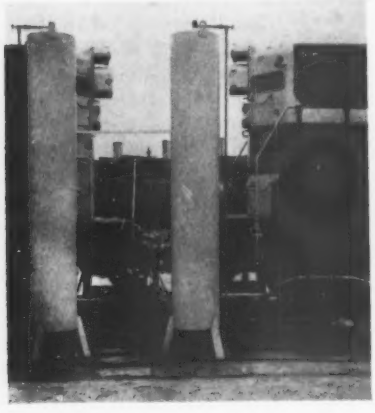
The material balance on these piston rings showed an actual weight loss (scale method) of 6,197 mg, and a calculated wear (radioactive method) of 5,570 mg. The discrepancy was 627 mg, or a loss unaccounted for by radioactive means of 10.1 per cent.

Sufficient data were obtained under one set of conditions in the two test units to estimate the precision of the test method. A total of 13 tests at No. 8 throttle using the same fuel and lubricating oil were run in the two units over a period of about three months. Both units were equipped with chromium plated liners and irradiated cast iron piston rings were installed in the second ring grooves of nine assemblies. The calculated standard deviation of the 13 runs was 8.8 per cent of the average wear rate for these runs.

Using conventional statistical methods, calculations were made of the number of tests required to obtain a given degree of precision for varying levels of confidence. With 90 per cent confidence, a single run should be within plus or minus 16 per cent of the true wear rate. In other words, 9 times out of 10, a single run should give a wear rate which is within plus or minus 16 per cent of the truewear rate. Similarly, the average wear rate of a pair of runs should be within plus or minus 11 per cent of the true value 9 times out of 10. Test accuracy was improved markedly by increasing the number of irradiated rings from four to nine.

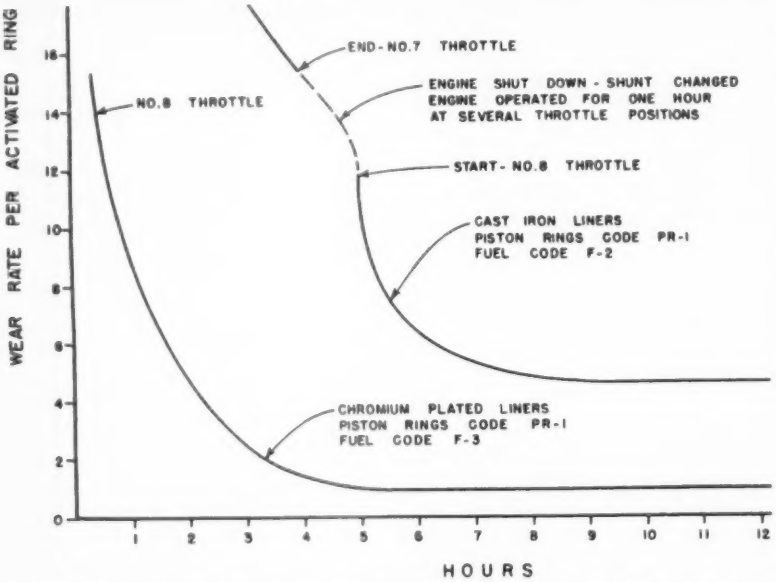
The use of an automatic recording clock to time the periods between a given number of radioactive counts greatly facilitates the collection of data and insures maximum accuracy of results. Utilization of an electronic computer to calculate the rate of wear from the recording clock data also insures maximum accuracy of calculations.

These radioactive investigations are being conducted as part of a coordinated mechanical research program with the Union Pacific and the Denver & Rio Grande Western.

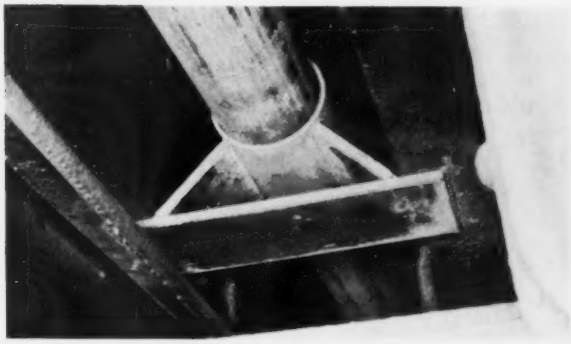


Calibrated tanks measure lubricating oil consumed during tests. Transfer pump at right could move oil to or from either of the engines.

Scaler, measuring radioactive counts, and automatic clock, recording interval between predetermined number of counts, gathered wear data.

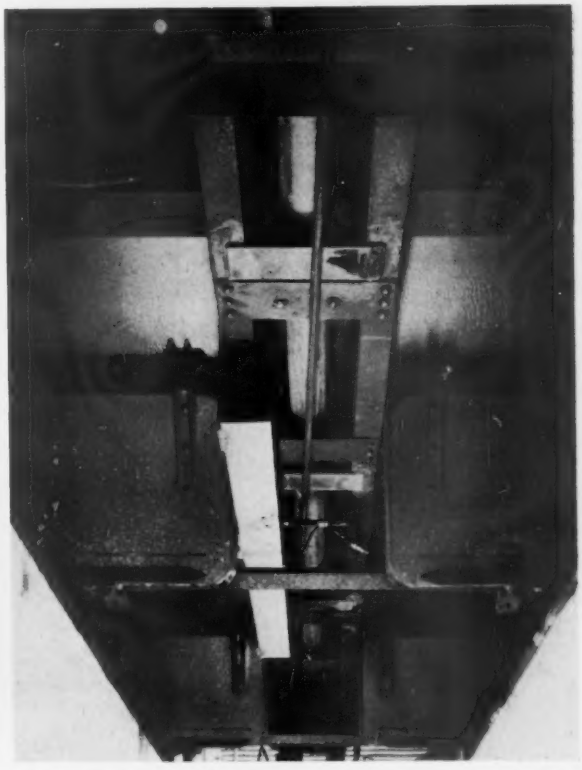


Break-in characteristics of engines are shown by comparing the wear of piston rings in cast iron and chrome-plated liners. Wear rate is in milligrams of iron per ring per hr. Initial rate on cast iron liner was about 29 mg/hr which dropped off to 15 mg/hr after 4 hr in No. 7 throttle position. Chrome-plated liners showed lower ring wear rate initially and this leveled off at a rate about one-fifth that of the standard cast iron liners.



Floating tube is supported at 5-ft intervals by support straps welded to the bottoms of center sill flanges.

Solid plug at end of tube contacts rear of yoke. The draft gear is 3¾ in. away from rear draft stops.



Floating tube is 34 ft 1⅞ in. long under this hopper. Channel at center supported test leads during impacts.

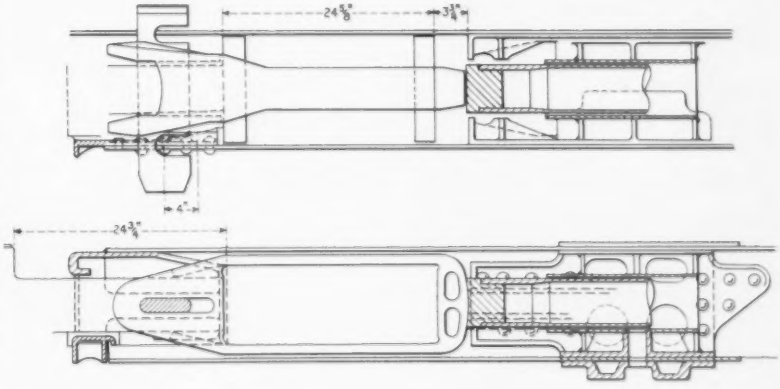
To Double Impact Energy Absorption . . .

C&O Develops Floating-Tube Center Sill

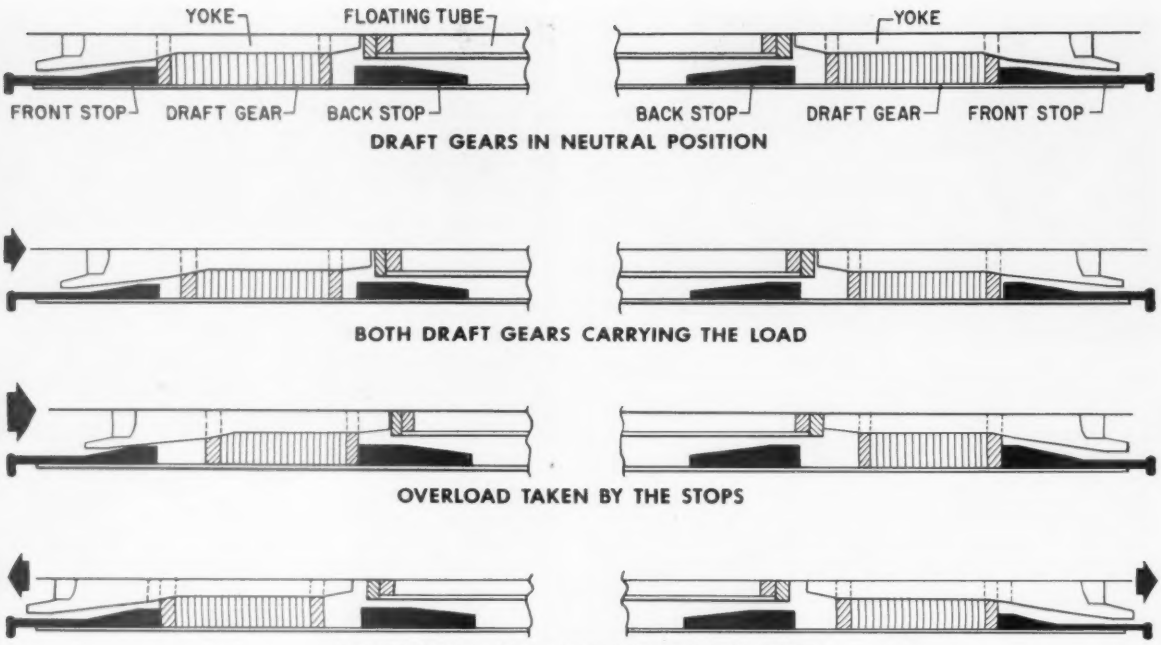
NEED FOR GREATER PROTECTION of cars and lading during switching impacts has prompted the development of an underframe in which a floating tube is introduced between the two existing draft gears in a car in such a way that they are made to work together regardless of the direction of impact. The development work was done by the Research department of the Chesapeake & Ohio during 1957.

C&O hopper 110261 was then equipped with this device. Subsequent testing has shown the arrangement to be effective in distributing impact forces more uniformly through the car structure, in increasing energy absorption, and in reducing coupler forces. Standard Car Truck Company has recently been given a license to sell this underframe design.

In making the initial installation on Car 110261, a 34-ft 1⅞-in. column was placed between the butts of the yokes. This column—5.5 in. OD, 110 API high-tensile oil-well casing—is supported at regular 5-ft intervals inside a standard 41.2-lb Z-section center sill. This pipe is strong enough to transit the gear closing force of 400,000 lb. The pipe is used to back up the draft gear rather than the buff lugs, which



Center casting was specially made to act as guide for the floating tube. Draft key slots were extended to allow for compression of two gears.



Draft loading finds gears in normal position against front stops. When there are buffing loads, the two gears come into play with force transmitted from one to the other by the floating tube.

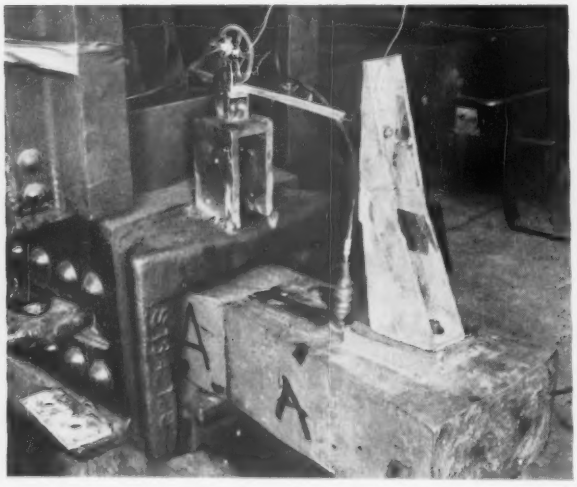
are now moved back sufficiently to allow both gears to close and to compensate for the 1-in. elastic compression of the pipe under a 400,000-lb force. In this way, while the gears are operative, the pipe transfers the buff force; but any oversolid blows exceeding this force are taken by the buff stops in their new locations.

To accommodate this device in a standard car, new center fillers, designed to have a passage for the pipe, had to be applied. The 24¼-in. shank couplers, same as used with the new 36-in. draft gears, allow for the longer travel of the new device. The car has standard National Malleable M-17-A draft gears and conventional Y-40 yokes. Key slots had to be lengthened by 3.75 in. to allow for the greater travel produced by this system. Rear draft stops were moved toward the center plates this distance also.

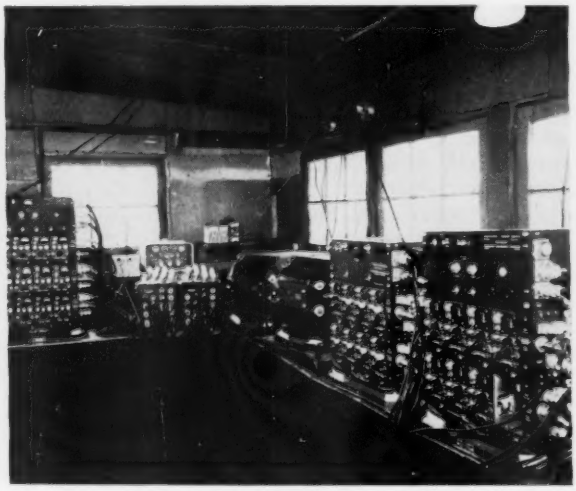
Test Programs

The hopper car equipped with the floating-tube center sill was tested at the Technical Center of National Malleable & Steel Castings Co. in Cleveland late in 1957 and again in

Tests Were Made at National Malleable 'Tech' Center



Dynamometer bumper and electronic gear-travel gage were installed on "struck" end of test car during Tech Center impact program.



Instruments installed in test site shelter are typical of complex and high-speed recording gear which can be utilized during a test program.

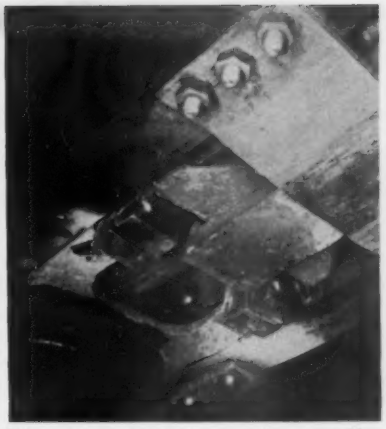
1958. The floating-tube center sill

- More uniformly distributes impact forces through the car than does the conventional draft gear arrangement;
- Increases energy absorption during impact by 50 per cent; and
- Reduces coupler forces by as much as 40 per cent.

National's Technical Center report concluded that "improved performance may be expected from cars equipped with the floating-tube center-sill arrangement."

Until the use of the long-shank coupler for 36-in. gears becomes more common, it would be necessary to shim the draft-gear pocket if a standard coupler were to be used for replacement. In this event, 3.75-in. blocks would have to be welded to the rear draft stops to produce the conventional 24⅝-in. draft-gear pocket. Temporary repairs of this type would become less common as the use of the long-shank coupler increases.

Yoke strap guides were installed after first test program to assure alignment of yoke and gear during buff loading.



Shims at rear stops make underframe act like that of normal car. AAR has issued sketch of similar shim for these cars.

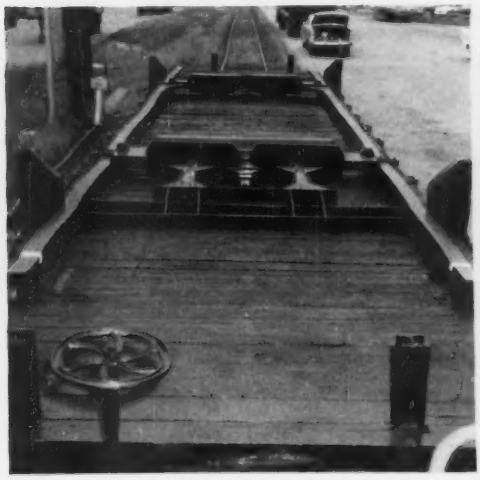
The AAR has recently authorized the Chesapeake & Ohio to apply this new draft gear arrangement to 25 cars in interchange service. Ten box cars for automobile glass service are now equipped with the floating tube arrangement and with 24⅝-in. pocket draft gears of various capacities to develop the best combinations. Included are five with Peerless T-1's, two with Cardwell Mark 40's, and three with standard AAR types. Quarterly performance reports have been requested by the Committees on Car Construction and Couplers and Draft Gears.

Piggyback Fleet Continues To Grow

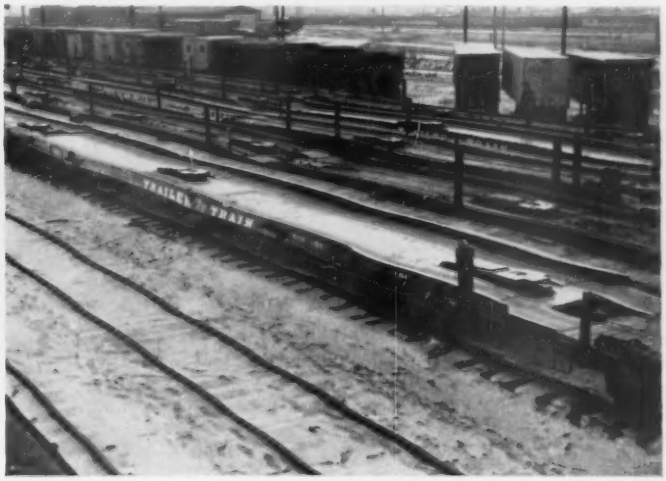
Approximately 6,000 of the 55,000 flat cars in the US are now handling truck trailers, according to H. H. Rogge, president of ACF Industries. Such cars are now averaging 175 miper-day as compared with the 47 miper-day for all freight cars.

The trailer-vs-container competition is as yet unresolved, and there are numerous methods for securing both types of equipment during transit. Two recent entries in this field are shown below. MP shop forces at Sedalia, Mo., converted six cars for container service by installing floating cradles.

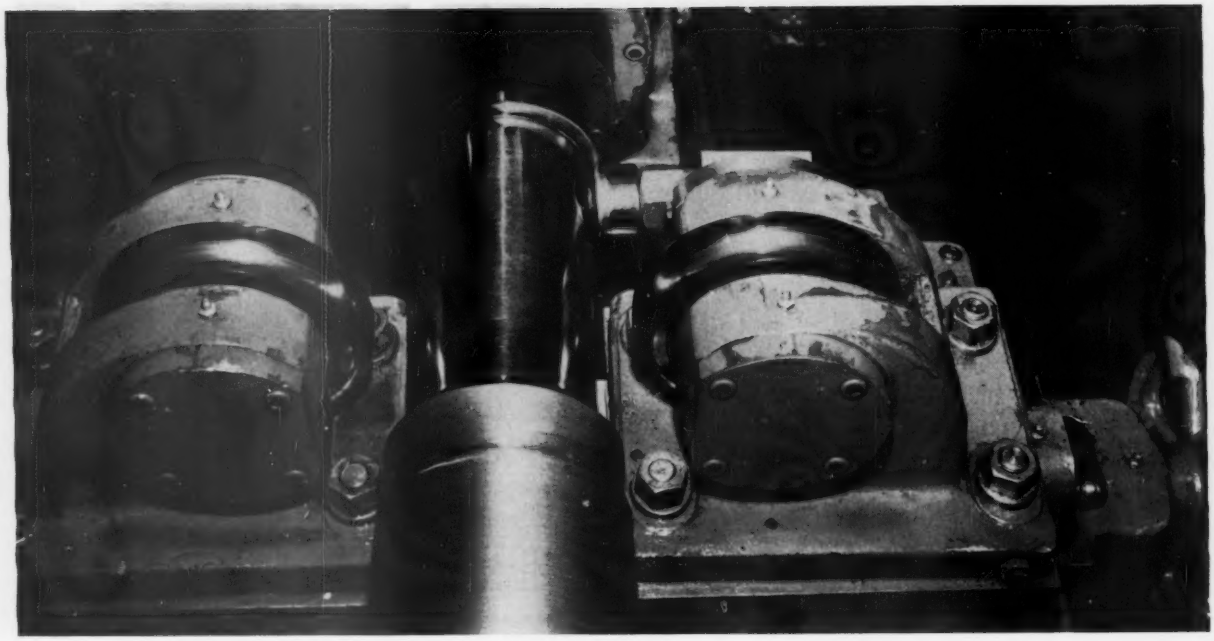
ACF and Pullman-Standard have been building almost 1100 of the 85-ft units shown at the right. Trailer Train, representing ten railroads, and the C&O, FEC, StLSW, and UP will get these cars. Their light weight is over 70,000 lb, and each has two trailer hitches.



Container car for Missouri Pacific will handle 32-ft and 37-ft containers in cradle with V-shaped members.



TOFC cars for Trailer Train and five individual railroads will hold two 40-ft trailers. Each has two ACF trailer hitches on its steel deck.



Rolling of insides of axle end collars is expected to improve solid bearing performance. All newer burnishing machines are getting the special roller attachment.

CPR Improves Axle End Collar Finish

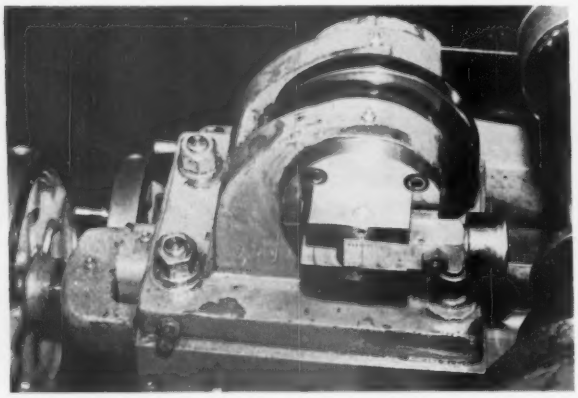
. . . *With Special Roller Attachment*

As one more step in improving the performance of the solid journal bearing assemblies under its freight cars, the Canadian Pacific has been installing an attachment on each of its burnishing machines to give the inside surfaces of axle end collars a better finish. It has been CPR experience that journal lubricating devices require a higher grade of surface finish on bearing areas and particularly on the end collars.

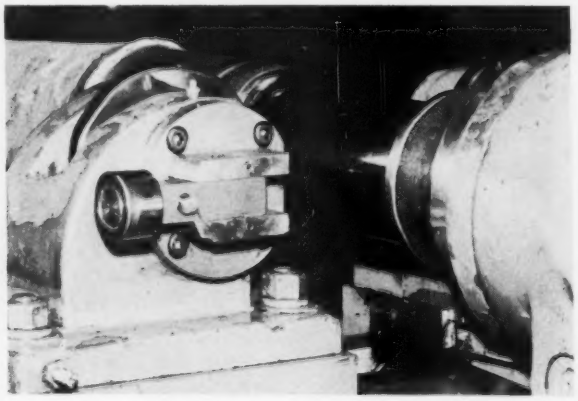
Recent AAR action requiring a surface finish of 125 microinches maximum on machined "bearing contact areas," and of 16 microinches on these surfaces when they are rolled, indicates that the CPR is not alone in its decision that today's freight-car journals need better surfaces. Tests with a Profilometer at the Angus (Montreal) wheel shop showed that rolling on a conventional burnishing machine would produce journal surface finishes which ranged from 13 to 30 microinches. At the same time, it was found that the inside of the end collar, which is the thrust bearing surface, had a finish of from 60 to 250 microinches when processed in the normal way.

This thrust surface is a "bearing contact area" as far as CPR mechanical men are concerned. L. B. George, chief of motive power and

(*Continued on Page 38*)

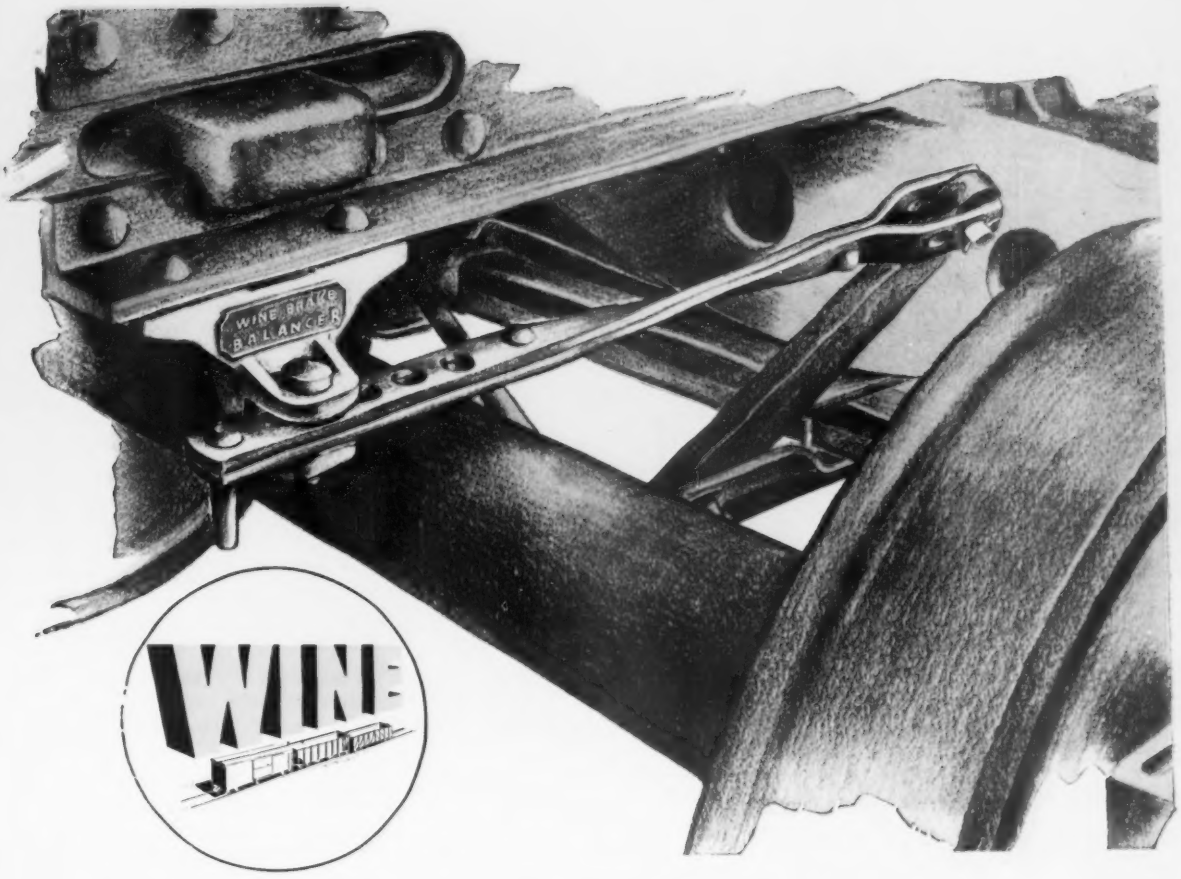


Tool-steel roller is supported on roller bearings. Roller has diameter of 2½ in. and width of 1⅜ in. Bolt and nut to left of roller form adjustable stop for positioning arm which holds roller.



Roller and arm are pivoted on ⅝-in. pin. Arm is 1¼ in. square bar stock. Device is attached to regular burnishing roll head with four cap screws, and is positioned only by pressure from tool post.

EQUALIZE BRAKE FORCES..



WINE

BRAKE BALANCERS

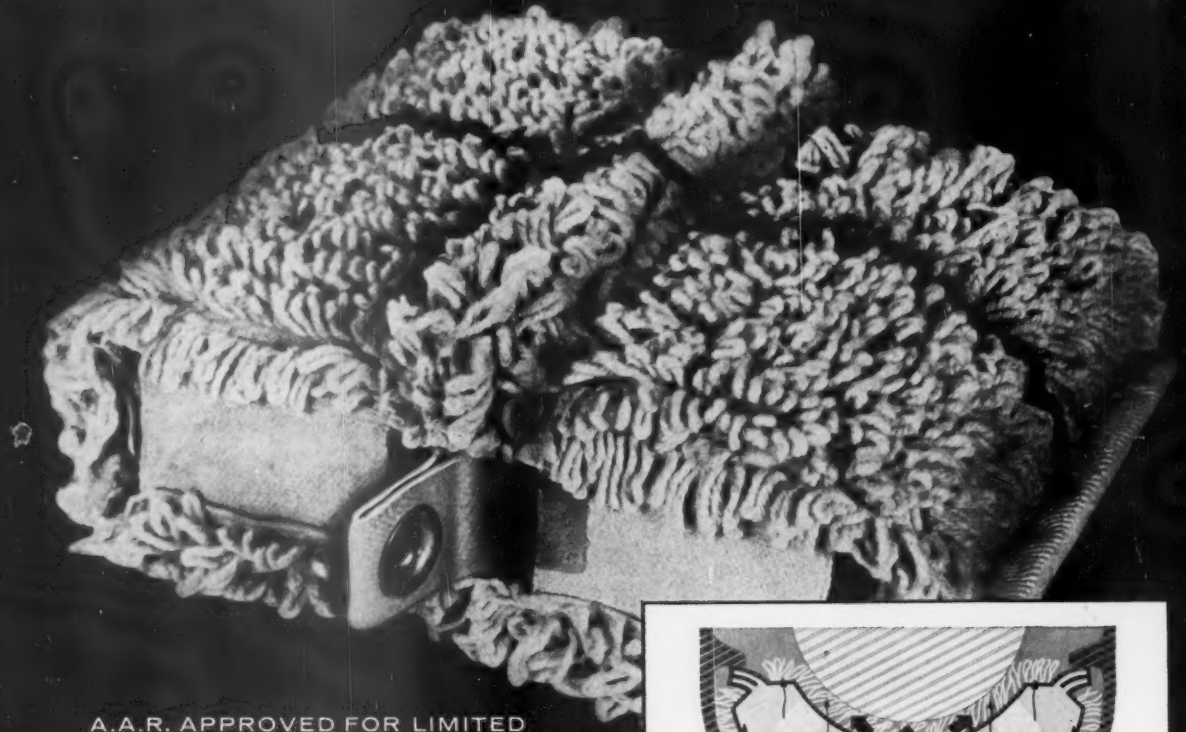
Eliminate truck distortion . . Greatly reduce maintenance . .

Development of the Wine Brake Balancer has proved the solution to unbalanced braking forces that develop with the conventional truck brake arrangement.

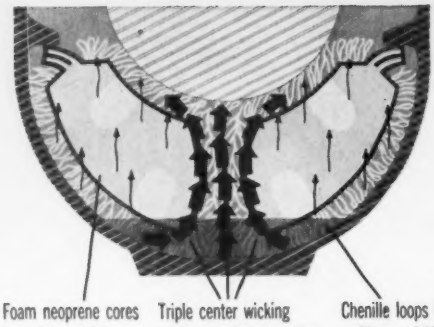
The Wine Brake Balancer replaces the standard dead lever connector and eliminates the necessity of the dead lever connector bracket on the truck bolster.

Instead, the Wine Brake Balancer has brackets secured to the center sill flange at each end of the car, and connectors extend from these brackets to the dead levers on the truck. This arrangement "balances" the brake forces by returning them to the underframe of the car. This simple, yet rugged design meets all service requirements on any capacity car. Write for complete details.

THE WINE RAILWAY APPLIANCE CO., TOLEDO 9, OHIO



A.A.R. APPROVED FOR LIMITED
INTERCHANGE SERVICE (3,000 CARS)



Foam neoprene cores have both wicking and pumping action

Triple center wicking action, direct from bottom of box to journal

Chenille loops for resiliency, wicking and distribution

Triple center wicking action feeds an abundant supply of oil to the journal by the most direct path. More oil flows up through the neoprene cores and still more wicks up through the fabric panels, assuring complete saturation of the chenille cover at all times.

NEW

ABSCO

LUBRICATING PAD HAS TRIPLE CENTER WICKING ACTION

The Absco journal lubricating pad is the first and only pad to be engineered and produced with all the advantages and characteristics that critical railroad men prefer!

Positive wicking action. Special twisted loop chenilling distributes steady flow of oil over entire journal. Specially engineered center section provides additional path for direct wicking action at shortest distance between free oil and journal. Foam neoprene cores provide further wicking capacity.

Resilience. Foam neoprene cores, specially compounded for high resilience with great resistance to set. The compressible chenille loops add to overall resilience.

Ease of application. Easily installed. No tools required. Reversible side to side, top to bottom, end for end.

Stability. Sturdy fabric retainers resist shifting, even at low temperatures.

Interchangeability. Absco pads fit standard A.A.R. journal boxes. No modifications necessary.

Ease of renovation. Built to withstand roughest cleaning methods. No delicate or heavy metal parts to break or tear loose.

Non-linting. Thoroughly washed and pre-shrunken cotton wicking material was especially selected for its non-linting characteristics.

Long life. Accelerated life tests indicate durability far in excess of the present renovation interval, even under extreme service conditions.

This impressive combination of features and advantages is exclusive with the Absco lubricating pad.

A-2996

AMERICAN Brake Shoe COMPANY

RAILROAD PRODUCTS DIVISION • 530 Fifth Avenue, New York 36, N. Y.

ICC Order Interprets Ex Parte 174 Rules

NO PASSAGEWAY will be required through the nose ends of car body type A units, according to an interpretation of Locomotive Inspection Rule 229(g) contained in an order recently issued by the Interstate Commerce Commission. The order contained a series of interpretations of rules in Ex Parte 174, Rules and Instructions for the Inspection and Testing of Locomotives Other Than Steam, issued on March 4, 1958. Only two months ago the commission extended the effective dates for many of the provisions of its original order which required the alteration of existing locomotives (RL&C, Jan. 1959, p 10).

RULE 229 of the original order had required that "safe and suitable means" be provided for passage between units with open-end platforms. The commission's interpretation now says that the locomotives affected will be those with "platforms not protected their full width by a continuous barrier and which permit an open passageway between the platforms of two *similar* units when coupled together. No passageway will be required through the nose ends of car body type units similar in design to present diesel-electric A-type units."

Other rules clarified by the commission in its order of January 8, 1959, included the following:

RULE 201(c): "On locomotive units coupled in multiple control, the parts and components capable of producing power to propel the locomotive or train, the air brakes capable of starting or stopping the locomotive or train, and the sanders, shall respond to control from the operating compartment."

RULE 201(d): A simultaneous audible alarm and visible indication of slipping or sliding wheels need not be provided, according to the commission. However, *either* an audible or visible indication of each wheel slip or wheel slide on each unit must be indicated in the controlling cab, although the warning system need not distinguish between a slip or a slide.

Fireman's Brake Valve

RULE 204(b): "The requirement for a 'brake-pipe valve accessible to the fireman when stationed in his usual position is complied with by installing at or adjacent to the fireman's position any type of valve which will bring about an emergency brake application. The emergency valve at the hostler control station near the end of a unit meets the requirement of this rule if it can be operated from a position adjacent to the exit door at the end."

RULE 205(f): The provision of a device in the air-compressor discharge line which will "effectively" restrict passage of oil throughout the system has been interpreted by the commission to require no additional equipment if "devices presently installed effectively restrict passage of oil."

RULE 211(d): While no specific procedure is prescribed for determining leakage from the control air system, the commission recommends the following steps to determine compliance with the provision that leakage shall not exceed an average of 3 lb per min in a test of 3-min duration: (1) the control air system should be fully charged; (2) main reservoir pressure should be reduced below standard control air pressure, unless a side vented cock can vent to atmosphere the line between the cock and check valve; (3) the throttle should be placed in No. 1 position, the reverser in either forward or reverse position, and on units so equipped the transition lever placed in No. 1 position, and these should be kept in such positions throughout the test, and (4) the leakage as read on the control air gage should be checked for 3 min.

RULE 220: The "total uncon-

(Continued on page 41)

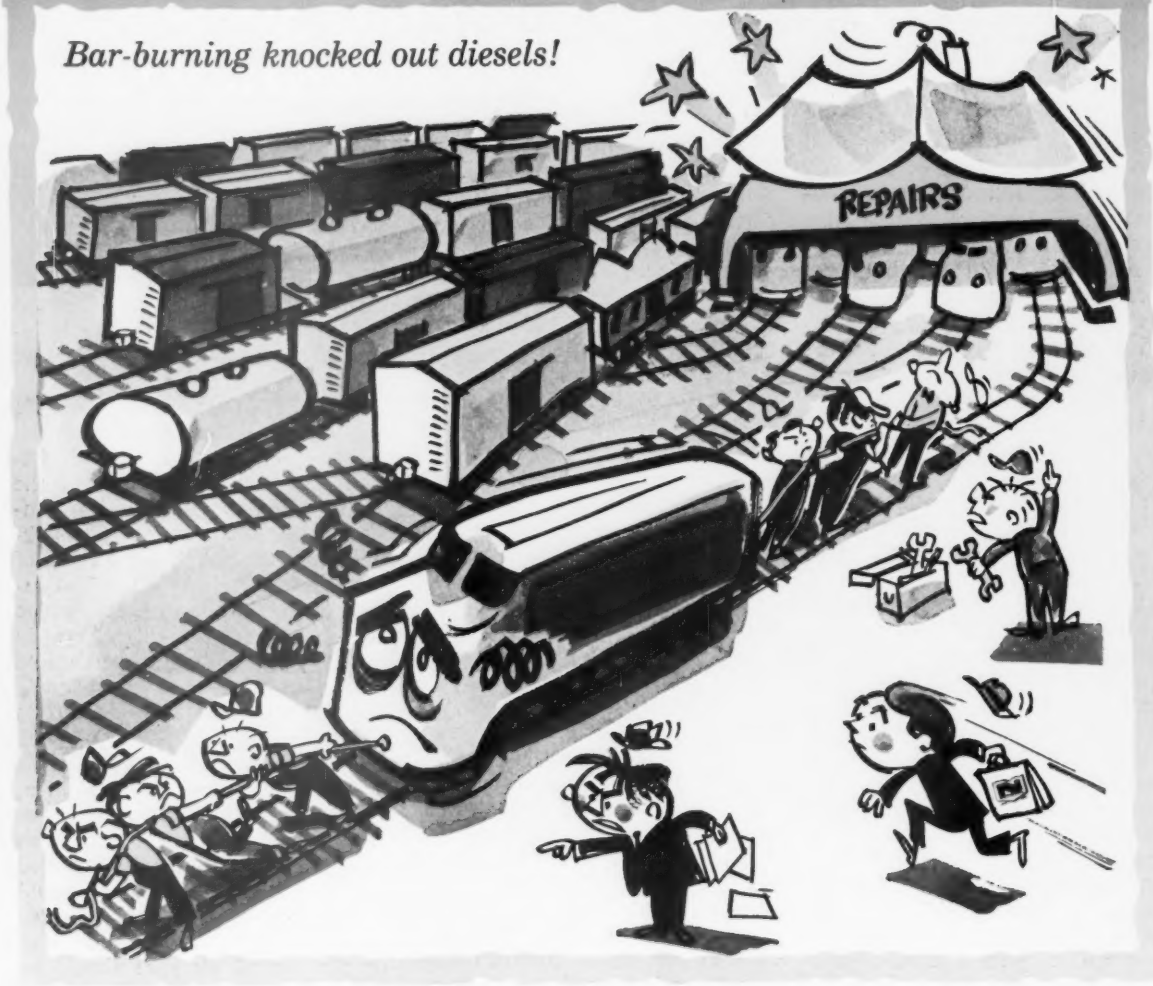
Problem: *Which Units Require "Safe and Suitable" Passageway?*

NO

YES

NO

Bar-burning knocked out diesels!



A NATIONAL Brush
TRADE MARK

put these diesels back on the line!

MURPH VARNEY

Freight ready — locomotives still in maintenance shop. This happened all too often on one mid-western railroad, says "National" Carbon Brush Man Murph Varney.

The reason: increased maintenance time required to recondition generator commutators.

The cost: considerable, because of lost diesel availability.

After carefully analyzing workloads, Murph recommended "National" brush grade DE-2. By matching brush quality to workloads Murph was able to alleviate the trouble. Every day there is less commutator trouble.

Your brush problems will respond to expert treatment, too. And there's a "National" brush expert as close as your telephone. If you prefer, write to National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y.

"National", "N" and Shield Device, and "Union Carbide" are registered trade-marks of Union Carbide Corporation

UNION CARBIDE

NATIONAL CARBON COMPANY • **Division of Union Carbide Corporation** • **30 East 42nd Street, New York 17, N.Y.**

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

...when it's a Bethlehem Wheel

These things you know for sure when you order Bethlehem wrought-steel wheels:

- You're getting a product that has measured up to every service requirement for over thirty years.
- It's a product widely installed in *all* fields of railroad service—freight, passenger, diesel.
- It long ago earned the confidence of users, who have purchased more than 2½ million Bethlehem wheels for freight cars alone.
- Mileages in the 300,000 to 400,000 range are common. This takes sound wheels, strong wheels, tough wheels —the kind produced by forging and rolling.

The Bethlehem wrought-steel wheel is the known value, accepted through the years. You can buy it with assurance.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Ready for road, these mill-type gondolas brought Santa Fe ownership to 550 of these extra-long cars. Corrugations on side sheets extend below rivet line to provide added stiffening. A 30-ft length of ¾ by 4-in. strap acts as a stiffener on the top chord angle.

Santa Fe Mill Gondola

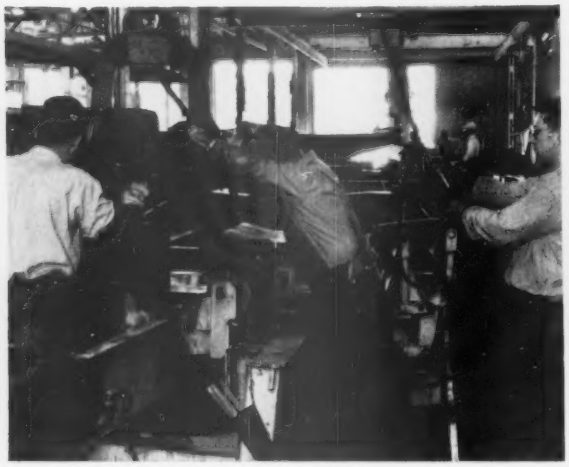
Continuous, shielded-arc welding completes center sill after two 36.2-lb Z-Sections are clamped in jig at start of assembly.

Bolster plates and other components are assembled in special jig. Bolsters are then moved Continuous, shielded-arc welding completes

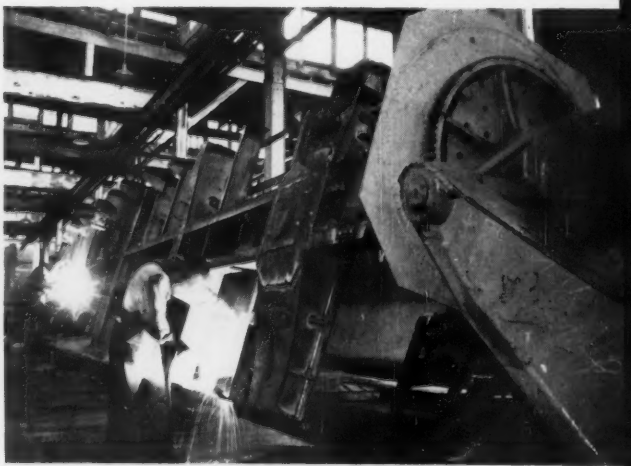
The Santa Fe's Topeka, Kan., shop production lines have been in high gear. Recently completed were 250 mill-type gondolas of 65-ft length and 70-ton capacity. The railroad now has 550 of these cars built during the past nine years.

Equipment on the cars includes nailable steel floors and drop ends. Retractable lading anchors are located under the bottoms of the top chord angles. Trucks have solid bearings and lubricator pads.

Steel shippers have recently been predicting shortages of mill gondolas as steel demand picks up.



Body bolsters, crossties and crossbearers are set in place in underframe jig before completed sill is put in position.



Positioner holds tacked underframe in position necessary to make down-hand welding possible for every step during its completion.

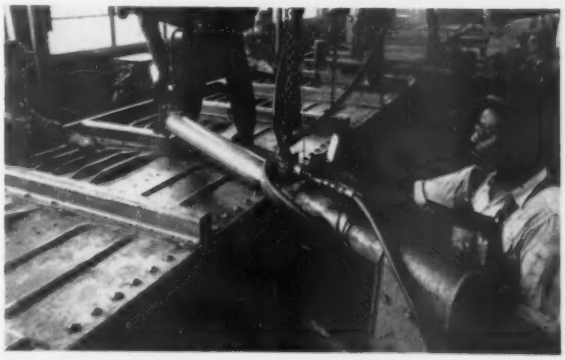
Formed side sheets of 3/16-in. LAHT steel are fitted up to top angle and side sill.

Side posts are attached to the side sheets by tack welding initially. Air clamp holds posts against the sheets for this welding. Sheets and posts have been punched previously.

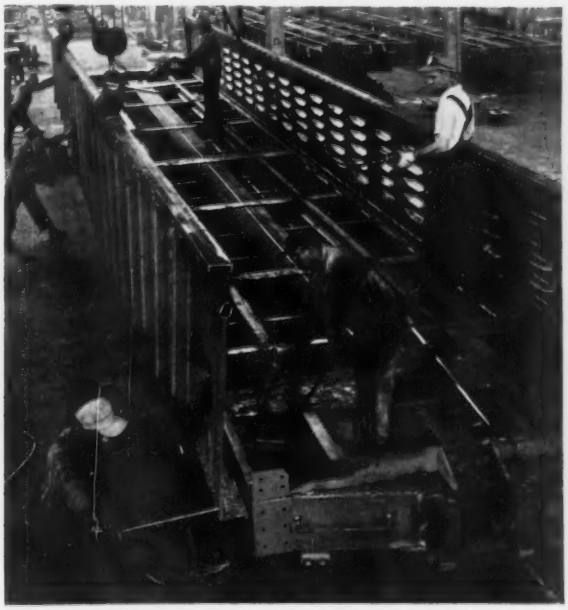
Production Line

Principal Dimensions of These Mill Gondolas

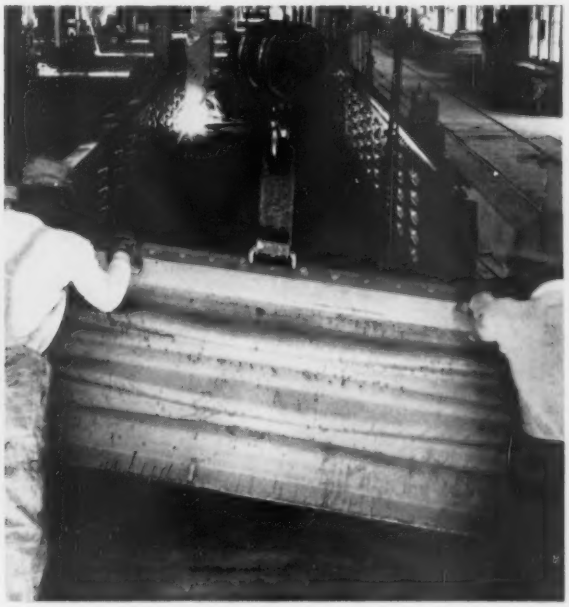
Outside length, ft-in.	68 - 0
Outside width, ft-in.	8 - 7
Outside height, ft-in.	7 - 3
Inside length, ft-in.	65 - 6
Inside width, ft-in.	7 - 9
Inside height, ft-in.	3 - 6
Capacity, cu ft	1,777



Posts, bulb angle, side sill are assembled with side sheets by this long-reach gap riviter to form the completed car side.



Side assemblies are installed on underframe which has previously been placed on trucks. Mill gondola begins to take final form.



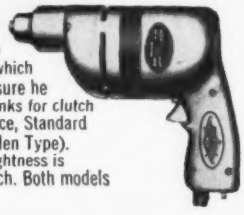
Nailable steel flooring is welded in one car while drop end goes in next one on production line. Most AT&SF mill gons have drop ends.

CERTIFIED SIOUX POWER

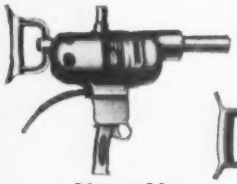
Electric Drills

SIOUX ELECTRIC SCREWDRIVERS

NO. 260 — 262
On No. 260 Super Screwdriver the operator controls the tightness with which a screw is set by the amount of pressure he applies. The ¼" Hex Drive takes shanks for clutch head screwdriver bits, Reed and Prince, Standard screws, Phillips, and socket head (Allen Type). On the No. 262 Super Screwdriver tightness is pre-determined by adjusting the clutch. Both models equipped with reversing switch.

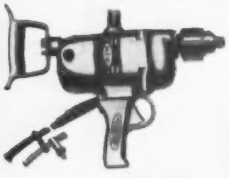


NO. 242
It fits the hand, and operates in restricted space like no other electric screwdriver. It quickly drives or removes all types of screws. No. 242 has a positive clutch; the operator controls the tightness by the amount of pressure applied. No. 246 has an adjustable clutch, so that it can be preset for any uniform degree of tightness desired.

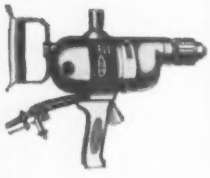


1" H.D. DRILL
No. 1579

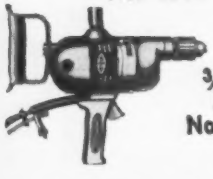
⅝" & ¾"
H.D. DRILLS
No. 1560, 1575



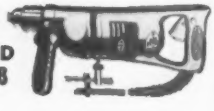
½" H.D. DRILL
No. 1550



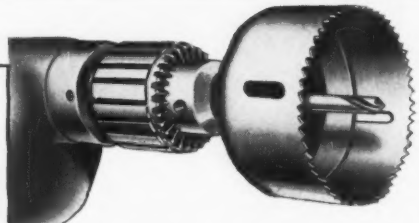
½" STD.
DUTY DRILL
No. 1510



⅜" & 5/16"
H.D. DRILL
No. 1517, 1519



½" SLOW SPEED
DRILL No. 1548



SIOUX HIGH-SPEED STEEL TEETH HOLE SAWS

will cut holes from ⅝" to 6" in diameter, in any free machining material to a depth of 1⅛". Alloy or stainless steel may be cut at slow speed. High-Speed teeth welded to chrome-vanadium body give maximum life and cutting ability.

POWER* SPECIFICATIONS SIOUX ELECTRIC DRILLS

When it's a SIOUX you know what it will do

Catalog Number	No Load Speed	H.P. and at Load	R.P.M. at Load Speed	Oz. Ft. Torque at Load Speed	H.P. and at Peak Load	R.P.M. at Peak Load Speed	Oz. Ft. Torque Peak Load
1475	2250	5/64	1525	4.9	7/64	1050	8.8
1480	1600	7/64	1140	7.9	5/32	790	16.8
1485	1650	3/32	1060	6.9	1/8"	620	16.7
1495	1650	3/32	1060	6.9	1/8	620	16.7
1498	400	3/16	275	45.0	9/32	215	108.0
1510	525	27/64	370	95.0	39/64	230	222.0
1517	925	13/32	670	49.0	9/16	540	135.0
1519	1250	13/32	860	37.5	9/16	500	96.0
1525	1650	5/16	1060	31.0	3/8	680	45.0
1541	925	13/32	670	49.0	9/16	540	85.0
1548	525	27/64	370	95.0	39/64	230	222.0
1550	525	7/16	325	108.0	17/32	175	252.0
1560	400	9/16	260	175.0	3/4	155	400.0
1575	400	3/4	205	308.0	1-1/8	125	748.0
1579	350	49/64	200	315.0	1-9/64	115	800.0
1472	1600	13/64	960	17.8	17/64	720	32.4
1473	950	13/64	575	31.6	17/64	430	55.0
1474	625	13/64	375	44.6	17/64	280	84.2
1477	950	13/64	575	31.6	17/64	430	55.0
1478	625	13/64	375	44.6	17/64	280	84.2
1479	1600	13/64	960	17.8	17/64	720	32.4

*for complete specifications

SEE THE NEW SIOUX CATALOG

when it's a SIOUX

You know what it will do!

The Horsepower and torque for each SIOUX drill is rated, stated, and certified. It isn't necessary to buy just a drill. When it's a SIOUX you know what it will do. See the power specifications for SIOUX Electric Drills in this advertisement.

NEW *Super Powered* **¼" and ⅜" DRILLS!**

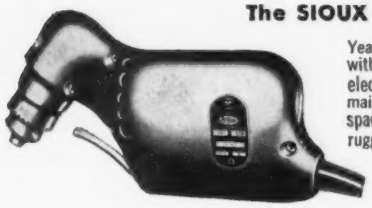
Here is super power to provide all the torque necessary for any operation where this type of drill would normally be used. (See specifications) And there's a speed for every need. It's an entirely new design in which the brushes have been located at the fan position at front of the drill. The advantages include cooler running, and easier inspection and replacement of motor brushes without partial or complete disassembly of the tool. Ball and roller bearing construction, with finest precision gears and mechanical design have achieved a new high in output efficiency.

¼" No. 1472, 1473, 1474

⅜" No. 1477, 1478, 1479

All time sales champ

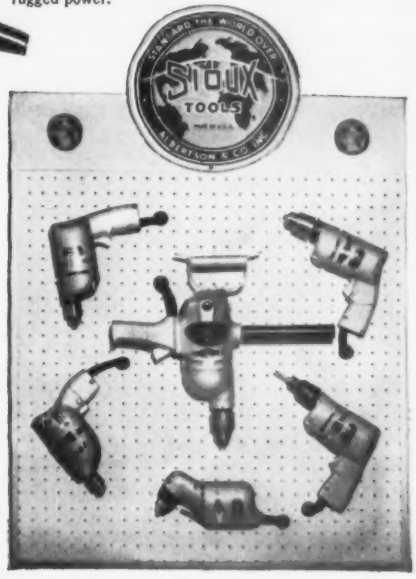
The SIOUX No. 1495 ¼" ALL ANGLE DRILL



Year after year this is a top seller in the SIOUX line. It's popular with almost everyone—auto mechanic, sheet metal worker, electrician, shipbuilder, woodworker, assembly line, factory maintenance man. It fits the hand and operates in restricted space like no other tool. It's a most convenient handful of rugged power.

Leading distributors everywhere display and sell Certified **SIOUX** *power drills.*

AUTHORIZED SERVICE AND DISTRIBUTORS IN PRINCIPAL CITIES

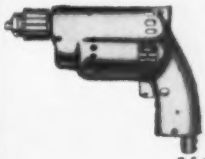


⅜" H.D. DRILL No. 1541

¼" H.D. DRILL No. 1525 BALL BEARING

¼" H.D. DRILL No. 1480 SEMI BALL BEARING

½" LT. DUTY DRILL No. 1498



¼" DRILL No. 1485

¼" DRILL No. 1475

SIOUX

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When Pete arrived back at the shop, he reported to his boss, Big Jim.

Frost in the Wrong Place

By Ken Wright

Pete was again on his way to the yard to check a mechanical refrigerator car reported in trouble. He was, of course, grumbling. "Sure seems," Pete mumbled to himself, "that they could tell you more than 'car not cooling.' "

When he arrived at the car, he found it was a single-unit system—one compressor, one condenser, and one evaporator. The engine was running and other conditions seemed to be normal except for the thermometers on the car side which showed temperatures above zero. The log book on the car showed the previous trip had been trouble-free. The load obviously had been fresh produce because the thermostat setting was 38 deg F.

But this new trip had been in trouble from the first inspection made after loading. The car carried a load of frozen juice and the thermostat was set for minus 10 deg. Pete noted that apparently there had been no pre-trip inspection made on the equipment between the two loads.

Returning the log book to its rack, Pete began his inspection. The compressor was running, and so was the condenser fan—both normal conditions. In the electrical cabinet, Pete found the evaporator fan contactor closed, but this would not necessarily mean the fan was running. This circulating blower fan is enclosed within the insulated load space and cannot be seen except by entering the car and removing some panels. This was out of the question. The car was loaded and some of that frozen juice would have to come out to make this possible.

Pete knew that he could check the fan later if it was necessary. The clamp-on ammeter from the shop would show if current actually was flowing in the fan motor leads. For the time being, he would pass this up and come back to it if necessary. The electrical system was apparently functioning properly. This meant that the refrigeration system should be inspected.

Pete, like all good refrigeration service men, started feeling the piping. The compressor heads were hot, which meant that the machine was doing its gas-compressing job. The line from the compressor to the condenser was hot. The pipe out of the condenser was still hot, but slightly cooler than that entering. This is normal. The liquid receiver was also hot and so was the line from the receiver to the strainer.

The strainer, however, was cold, and there was some frost on the line coming out of it. This was not a normal condition because the line from the receiver to the expansion valve should still be at least warm. Pete concluded that the strainer must be clogged. The drop in pressure there was causing the strainer to act in the same way as an expansion valve.

Pete went to the phone and made arrangements for setting the car out of the train and having it moved to the shop area where he could work on it. When Pete arrived back at the shop, he reported to his boss, Big Jim.

Jim wanted to know what Pete had found that required cutting the car out of the train. Pete explained that, although repairs would not be

(Continued on page 36)

This is the sixth article in this series, discussing the operation, maintenance and trouble shootnig of mechanical refrigerator cars.

LIMA Crane uses USS Shelby Seamless Tubing for strong, lightweight boom

The giant 190-foot-long boom on this Lima Type 802 Crane is strong and rigid, yet remarkably light in weight and completely maneuverable. The Construction Equipment Division of Baldwin-Lima-Hamilton Corporation, Lima, Ohio, fabricated the boom from USS Shelby Seamless Steel Tubing made of very high-yield-strength USS "T-1" Steel. They state many advantages are accrued because of the use of "T-1" Steel Tubing:

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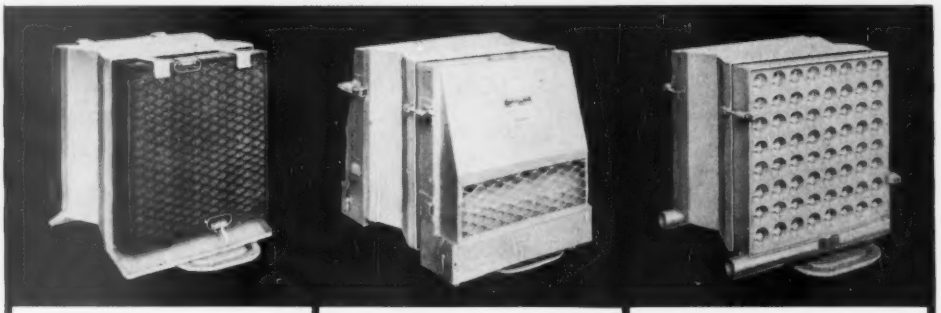
the only complete line of air filters designed for diesel locomotives



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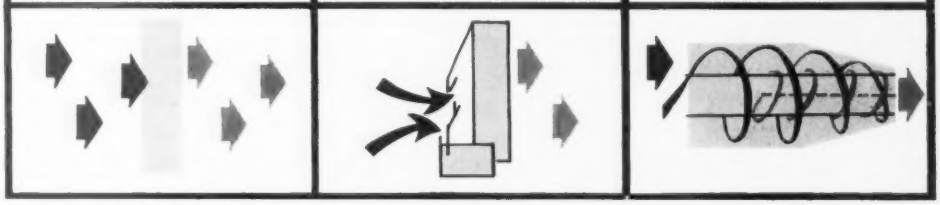

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WIRE ROPE

SLINGS

CLIPS

(*Continued from Page 32*)
extensive, more time would be required than was available during the switching of the manifest train in which the car had arrived. "How will you correct the situation, Pete, and will you need some help?" Jim asked.

"Oh, I'll have to take the strainer out, clean it, and put it back in," Pete replied. "I was wondering if you would like to have Lefty help me, although I can do the job by myself. This refrigeration work is new to Lefty, and it would help him to get experience. I notice during the class sessions that he wants to learn, but for some reason, he is mixed up."

While Pete and Lefty were waiting for a switcher to bring the car to the shop track, they assembled the tools they would need. Pete reminded Lefty that proper tools must be used. Jim came up and asked, "How do you change a strainer, Pete? Isn't it in a refrigerant line and under pressure?"

"Yes," Pete replied, "it is. Valves are closed and the system can be pumped down to such a low pressure that not much refrigerant will be lost when the system is opened. That's why the car had to be brought to the shop. I don't know how long it will take to pump the system down."

When the car arrived, Pete and Lefty went to work with Pete explaining, "Lefty, if I draw a sketch of the system I can explain what we're going to do." Pete took a piece of chalk out of his pocket and drew his sketch on a piece of plywood lying nearby. "The strainer is in the system ahead of the drier, solenoid valve, and expansion valve," Pete continued. "It must be located there to prevent foreign material from entering the expansion valve. Freon is in the same chemical family as carbon tetrachloride which means that it is a good cleaner. Any dirt, metal particles or other foreign matter will be loosened and carried through the system. Without a strainer, the expansion valve would be blocked. Our problem here is that this strainer has now collected enough material to cause a restriction."

"First, let's apply test gages to the compressor so we'll know what our pressures are. You take the seal caps off the compressor service valves," Pete directed. "This special socket fits the service valve stem. Back the valve out and then back seat it. Take out this plug and apply the test gage to the opening. The large pipe is connected to the suction service valve and the small pipe connection is the discharge for head pressure side."

The gages were connected; valves on the test gage manifold were opened; and the service valve was moved off its back seat slightly. "When you get a discharge of gas at the manifold," Pete pointed out, "close the manifold valve. This will purge any air out of the gage lines. The compressor is running and we will now close the outlet valve of the receiver." This prevents any more refrigerant from leaving the receiver. The Freon is then trapped in the receiver. The system through the strainer, drier, liquid solenoid valve, expansion valve and evaporator will be pumped down—its pressure will be lowered. At first, suction gage pressure does not drop very fast because all the remaining liquid refrigerant must be evaporated. Finally, the pressure will begin to go down fast.

"We could let the compressor run until the protection switch, dual refrigeration switch, stopped the compressor," Pete said. "If we did, the suction side would be in a vacuum state and air would be drawn in when we opened the system. We want to stop the compressor when suction pressure is about 2 to 3 psi. To stop the compressor, we will stop the engine, in this case."

Pete had Lefty watch the gage. When he signalled, Pete stopped the engine. "What's the pressure now?" Pete asked.

"It's down in the vacuum side, five inches," Lefty confessed. "What do we do now?"

In the time that it took us to stop the engine, the compressor kept pumping down, Pete explained. "We just didn't start soon enough to stop the engine. It is no problem. All we do is open the outlet valve of the receiver and let a little refrigerant through. This will raise the pressure."

When the pressure had gone back up to 3 psi, Pete said, "Notice here Lefty, that this strainer is cold. We don't open it until it has warmed up. If we did, the inside of the strainer housing would sweat and that would mean moisture in the system. Take these rags and lay them over there on the exhaust of the engine to warm them. We'll then warm this strainer housing with them."

While Lefty was doing that, he asked "Why can't I go in the shop and get a bucket of hot water to pour over it?"

"If we did, we would have to fool around and dry the outside of the strainer. That would take more time. While we are waiting for the rags to warm, front seat or close the discharge service valve of the compressor to make sure that no leakage will back up on us," Pete explained.

When the strainer housing was warmed, Lefty removed the cap screws and lifted the cover. They took the strainer out and cleaned it. Before replacing the strainer and cover, Pete examined the gasket and opened the receiver outlet line valve to purge air from the housing.

(*Continued on Page 38*)

These Items Should Be Covered During Pre-Trip Inspection of Mechanical Reefers

1. Fill fuel tanks.
2. Check engine lube oil level and the engine governor oil level. Add necessary oil.
3. Check engine coolant level and freeze point.
4. Clean fuel filters and fuel tank sump of sediment by draining.
5. Check for leaks—fuel, lube oil and coolant.
6. Check engine damper operation and safety shut-down.
7. Check security of all mount-assemblies and accessories
8. Clean all air filters, car body filters and strainers.
9. If car not equipped with car body filters then condenser and radiators should be blown with clean, dry, compressed air.
10. Clean engine compartment.
11. Check battery water level, charge, and battery blocking.
12. Check operation for proper refrigeration, heating and defrosting.
13. Inspect and service alternator, slip rings commutator brushes and bearing oil level.
14. Check compressor lube oil level.
15. Check refrigerant level in receiver.
16. Check refrigeration system for leaks.
17. Check compressor head and suction pressure.
18. Check a-c voltage and frequency.
19. Check battery generator charging rate and circuit.
20. Check, clean and defrost pans and tubes.
21. Check car thermometers, thermostat setting, and operation with Simpson Meter.
22. Clean interior of car with floor racks raised.
23. Enter information on Log-Trip record.
24. With all equipment functioning properly, cool car and allow it to cycle at the lowest thermostat setting.

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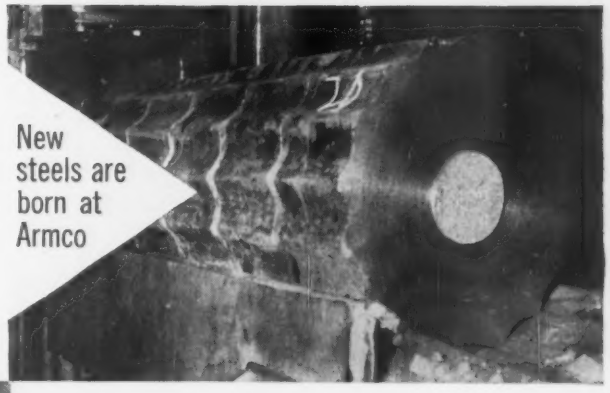
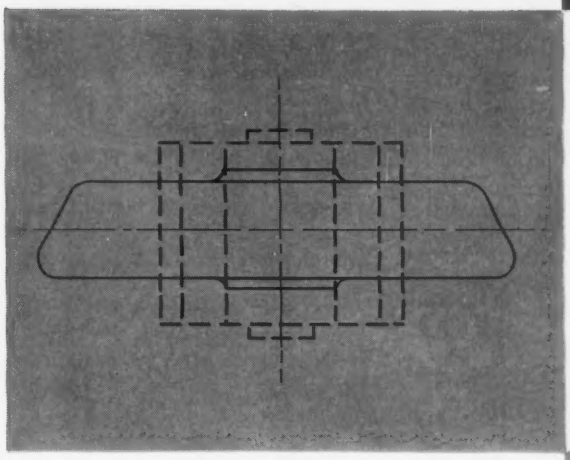
"Hot tops" on every ingot mold serve to keep gas holes and porosity (pipe) out of the steel ingot proper. And because Armco Wheels are made from ingot slices, cross-sectional surfaces of every slice *can be and are* closely inspected for quality.





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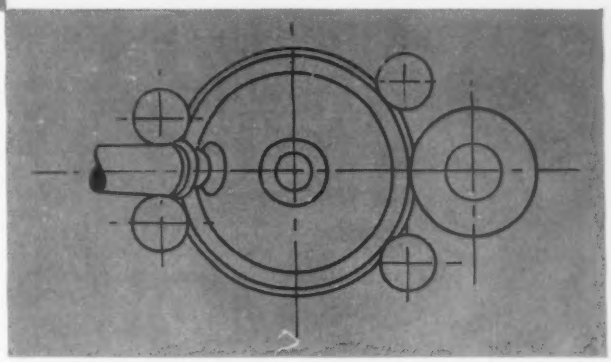

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Here's evidence of the dependable service that comes from forging and rolling: Between 1932 and 1957, Armco shipped more than one million one-wear wrought steel wheels. *Only six of these—less than .0006%—have been reported defective.*

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(*Continued from Page 36*)

While they were doing all this, Lefty asked, "A strainer couldn't have gotten that dirty all at once, could it?"

"Not likely," Pete replied, "but it is surprising how much the strainer will catch even after extreme care has been given to cleanliness. I would judge that this condition has been building up for some time. Probably was pretty well plugged last trip. With the thermostat set at 38 deg, full capacity wasn't needed. Enough refrigerant got through to maintain the 38 deg setting."

To put the refrigerating system back in service, they made sure that the valves were reopened. They then leak-tested the strainer housing. When the engine was restarted, Pete pointed out that the strainer was warm, and not cold as it had been when the car came in.

Pete went to Big Jim to report that the car could be released. "Did that trouble develop suddenly?" Jim asked.

"No, I don't think so," Pete replied, "at least, it didn't happen this trip. I would guess that before the last trip some work was done on the car and dirt got in the system. This dirt accumulated in the strainer. That last load was either fresh fruits or vegetables, and the car was not reported because it was able to maintain the 38 deg setting."

"Could today's failure have been prevented?" Jim asked.

"The trouble couldn't have been prevented, but the condition should have been detected before this road failure took place," growled Pete.

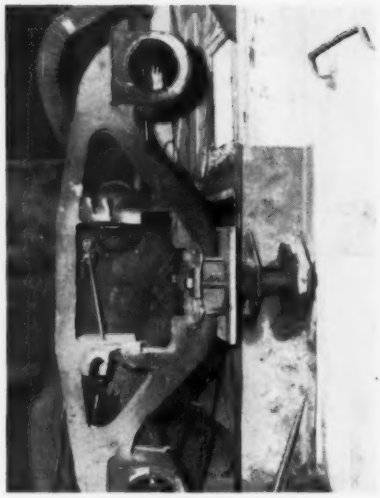
"How do you mean?"

"By doing the thorough job that you complained about when we had that last car in here for a Pre-Trip Inspection. You couldn't see why a car had to stand here at the shop, cool down to minus 10 deg, and cycle off," Pete answered. Just to see that a car will begin to cool is not enough. If its capacity is affected, a car can't "pull down" to its lowest temperature setting and maintain it. That's the trouble we just had. The Pre-Trip Inspection requires this pull-down test.

"You see, Jim, all mechanical refrigerator cars should get this Pre-Trip Inspection before loading to be sure that they will give trouble-free service on their next trips. The log book showed no record of Pre-Trip Inspection on that car." End

CAR REPAIR TIME-SAVER

Side-Frame Welding Jig



Jig, mounted to building column, can be swung to any position which will permit the side frame to be welded down-hand. Exhaust duct for welding fumes goes out at upper left.

A special jig designed to permit down-hand electric welding in building up worn surfaces of car truck side frames, is in use at the Brooklyn, Ore., shop of the Southern Pacific. It consists of a rotating fixture securely bolted to one of the steel building columns and arranged to hold a frame at the height for easiest welding.

In making this jig, an 8-in. length of 3-in. x 13-in. channel cut from an old spring plank is welded to an 18-in. square x 1-in. thick steel base plate which, in turn, has an 18-in. length of 4-in. pipe welded to the center to produce the rotating feature. The 4-in. pipe section is inserted and revolves in a short piece of 4½-in. superheater flue cut to the desired length and bracketed firmly to the building column.

The square plate and pipe section, therefore, revolve in the wall fixture and are kept from being pulled out by a collar on the end of the pipe. Indexing to any desired angular position is easily done and the position held by inserting a pin through holes in the telescoping pipe sections. A steel strap is applied through the spring seat and two bolts and nuts tightened to hold the side frame securely positioned in the jig.

Column guides, dust-guard seats, brake-hanger brackets, and other worn parts of the side frame are built up. The truck side is rotated easily by one man for down-hand welding. A wall-mounted blower with 4-in. flexible rubber hose has its suction end held above the work to discharge fumes.

CPR Improves Axle End Collar Finish

(*Continued from Page 22*)

rolling stock, rates the inside of the axle collar as a surface of critical importance in producing good solid bearing performance.

Once it was decided to improve the finish of the inside of the axle end collar, it remained for men at Angus shops to provide the equipment to do the job. An attachment has been developed which is being applied to all the newer burnishing machines in all CPR shops. It consists of a high-speed tool-steel roller supported on roller bearings in an attachment so the axis of the roller is at right angles to the axis of the axle being processed. The entire assembly can be swung out of the way to permit the use of the conventional burnishing rolls. It can only be applied to the end drive types of machines and cannot be used on axle lathes with turret tool posts.

The operation of rolling the inside of the collar takes only a few seconds and has in no way affected the output at wheel shops. With some changes in turning speeds, and with the new attachments, the CPR has found that journal surfaces with finishes of 8 microinches maximum can be produced along with finishes of 6 microinches on the insides of end collars. Both are expected to be reflected in improved journal performance figures.

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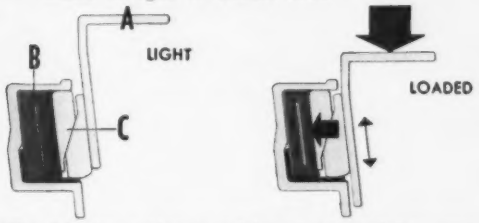
The TRUC-PAC spring package operates on the variable friction principle which gives a snubbing action that results in proper dampening control . . . either in light or loaded cars.



The friction action is achieved by variable pressures being applied to the wedge (A) by means of a rubber spring element (B) . . . pressing against the wedge shoes (C). The wedge and wedge shoes are in frictional contact at all times and consequently, will stabilize the cars while starting, in transit or stopping.

The rubber spring element, specially chosen for creep resistance and maximum service life is mechanically molded to a steel plate.

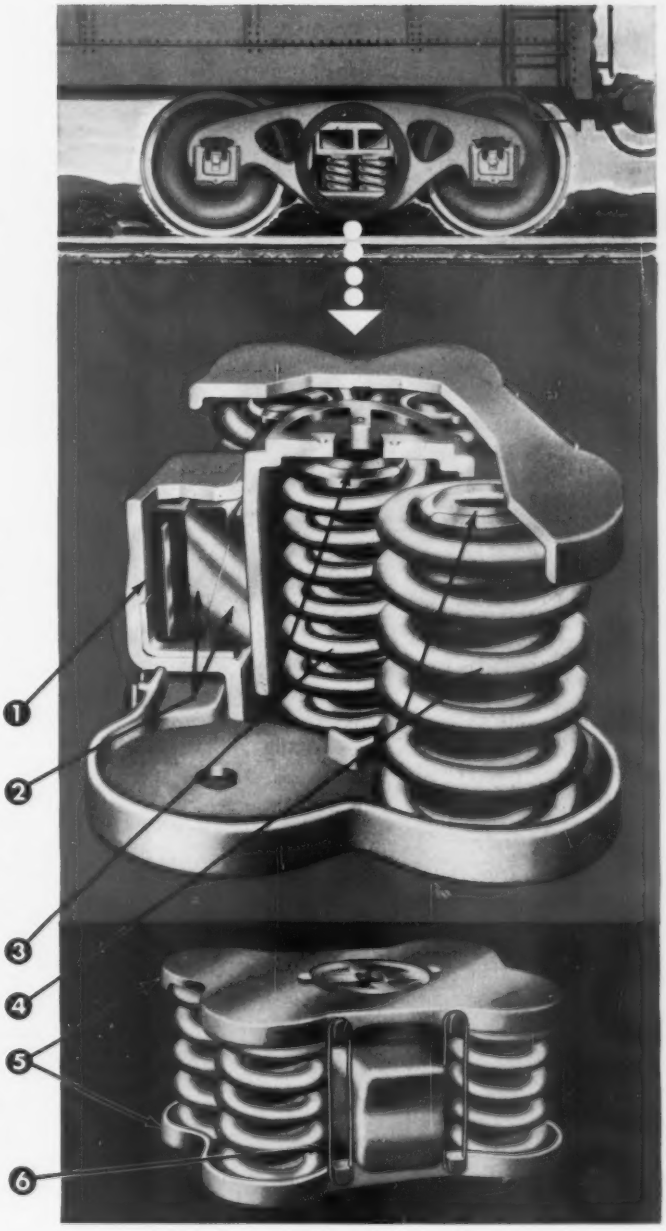
The wedge shoes, heat treated to resist wear, are alloy steel forgings and are split in two parts to eliminate "hammer" effect in operation. By this parting method the shoe in contact with the wedge bears against the housing wear plate and the other shoe bears against the roof of the housing.

The Double Coil wedge return spring provides additional load carrying capacity.

The Double Coil Truck Springs are shot-peened for longer spring life and provide 2½" travel.

Top and bottom plates are separate units and therefore have freedom of motion relative to the wedge and its housing. This eliminates the possibility of plate failure due to lateral or longitudinal motion.

The entire unit is precompressed to installation height by means of four links. These links are easily removed after installation.



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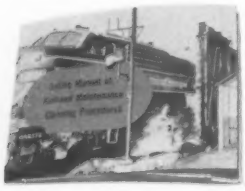

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New Problems in Car Interchange

This is the twenty-first installment of a series of questions and answers on the Association of American Railroads Code of Rules Governing the Condition of, and Repairs to, Freight and Passenger Cars for the Interchange of Traffic which may help car men clarify their understanding of the philosophy, intent and requirements of the Interchange Rules. The answers given to the questions are not to be considered interpretations of the rules of Interchange, which can only be rendered by the Arbitration Committee acting officially. The comments, however, come from a background of intimate association with the application of the rules. Obviously, comments or opinions as of today, may be inapplicable after a revision of the rules or further interpretations by the Arbitration Committee.

Why is it important and necessary to comply with all of the provisions of Paragraph (c)(9) of Rule 17? (218)

It has been proved that riveted type coupler yokes are inadequate for present train operations. They should be eliminated as soon as possible. Furthermore, where a repair point substitutes a riveted type yoke for a cast-steel yoke in a foreign car, it represents a loss to the repairing road in that no charge is then permissible versus the car owner.

When other than tank cars built new, rebuilt or overhauled are now painted, what new requirement must be observed with respect to stenciling? (219)

Under the requirements of new Paragraph (s)(9) of Rule 3, the proper AAR mechanical designation must be applied on the same line and directly to the right of nominal capacity markings.

Prior to January 1, 1959, the fourth paragraph of Rule 7 required that the weights of many forgings, structural or pressed-steel shapes as well as castings must be shown on the original record of repairs, except where arbitrary weight was specified in Rule 101. Why is it now no longer necessary to go to the expense of weighing and recording many of these same items? (220)

This paragraph now specifies that where there is now a net, applied, price in Rule 101 which includes such material items, the weights involved need not be shown. All of the net, applied, prices in Rule 101 should be carefully studied by those directly concerned so as not to cause needless expense in this respect.

Why was former Interpretation No. 1 to Rule 8 eliminated? (221)

Because it is no longer necessary to show dimensions and weights on billing repair cards for helical truck springs applied.

Why is it important for those who prepare billing repair cards to fully understand and apply the present requirements of Rule 9? (222)

Because some new items have been added and others modified in connection with the addition of many new net, applied, items in Rule 101. This necessitates close observance of this entire rule as modified.

Under the provisions of Rule 19, what conditions must be observed in selecting draft gears for application to foreign cars? (223)

Such draft gears must be either new, reconditioned, tested and marked within the previous 10 years, or secondhand serviceable gears less than 20 years old and not previously reconditioned.

What changes have been made in the former drawing covering stenciling for C.O.T. & S. of air brakes? (224)

There is a new drawing shown on page 151 of the 1959 Code which covers stenciling for C. O. T. & S. as well as in-date test. Where either operation is performed, the car must be stenciled accordingly.

Under revised Rule 62, what additional feature is required with respect to journal bearings applied to foreign cars? (225)

Such bearings must have acceptance symbol of purchaser or his agent stamped into back.

Do the Interchange Rules provide allowances covering periodic attention to cars equipped with journal lubricating devices? (226)

Yes. New Items 168-A to 168-E were included in Rule 101 in the 1959 Code for such work.

Why is it to the advantage of each road to stock its repair points with a suitable supply of journal lubricating devices at all times? (227)

Because under the provisions of the third note following 168-E of Rule 101 when loose journal box packing is substituted for lubricating devices, regardless of condition, credit of 50 per cent of value new for such devices must be allowed car owner and no charge can be made for repacking.

ICC Interprets Ex Parte 174 Rules

(Continued from page 25)

trolled lateral motion" referred to in this rule means the lateral motion provided for in the design of the parts, plus any additional lateral due to wear. The limits on this lateral are 1 in. for truck wheels and ¾ in. for driving wheels when there is more than one pair.

RULE 226(a): The first sentence of the second paragraph of this rule requires that wheels mounted on axles shall have the mill scale removed before application. The second sentence, according to the Commission, is not to "impose unreasonable requirements." Wheels shall be kept clean enough to detect cracks and other defects in the course of normal inspection.

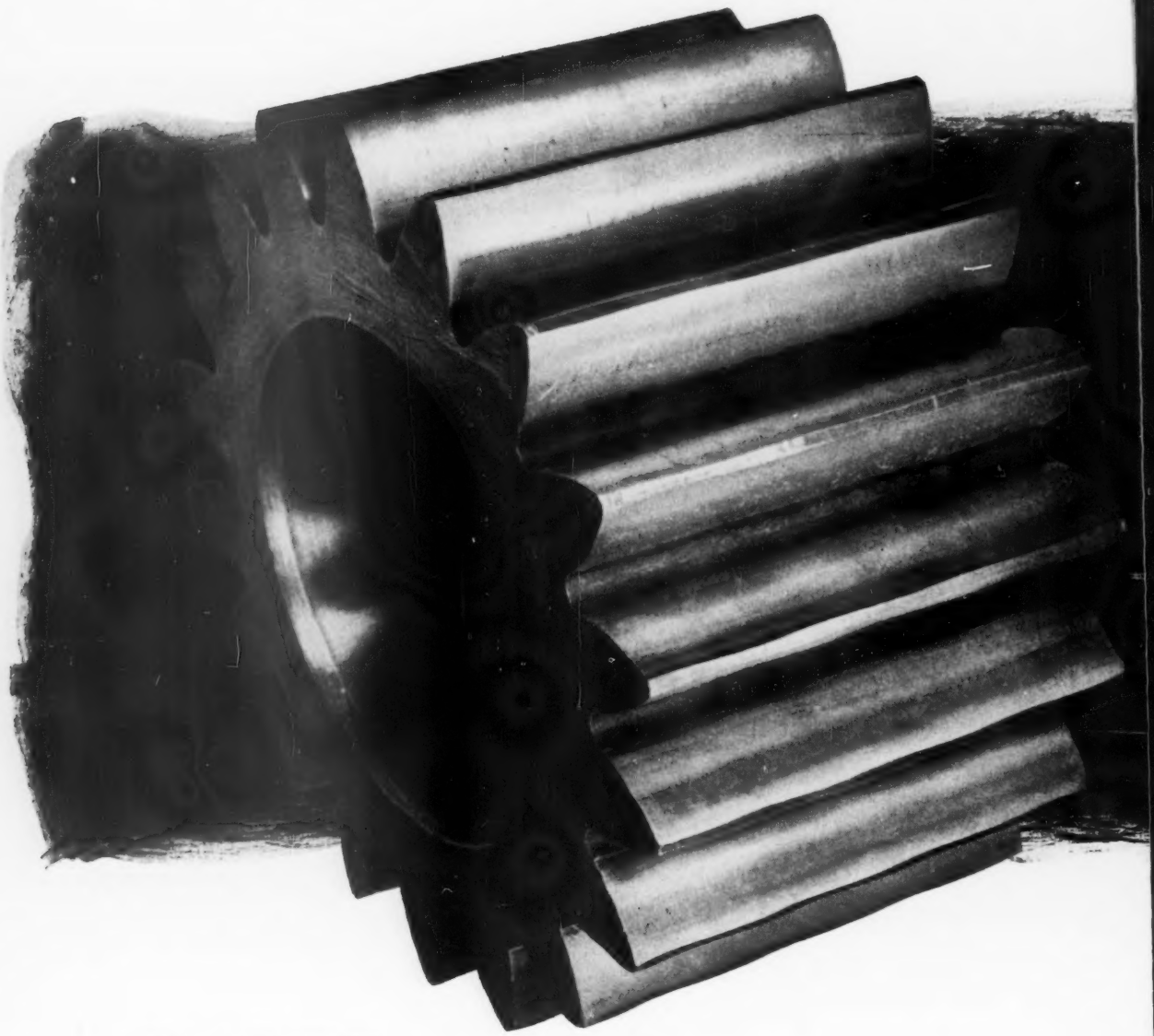
RULE 229(f): The concluding sentence of this rule means that regardless of adjustment of doors or windows, "Further ventilation shall be supplied to cabs by means of additional openings, located as required."

RULE 247(a): Requirements of this rule relating to the location and guarding of jumpers and cable connections are satisfied, the commission says, by installing a device which will support the cable at a sufficient height to provide "reasonable clearance."

RULES 255(b) and 323(b): The requirements that the safety cutout valve in fuel lines to engines and steam generators may be "reset without hazard" has been interpreted by the commission to mean that there is compliance if the valve can be reset without the need of an employee going under the locomotive.

The AAR, Seaboard, and Lehigh Valley presented written views on certain of the rules made subjects of the hearing which led to these new interpretations. In addition, the Lehigh Valley asked for extensions of the effective dates when its locomotives should be brought into compliance with Rules 204(b), 205(f), and 255(b). Because the effective dates for compliance with Rules 204(b) and 255(b) had already been extended prior to the hearing, it only remained for the ICC to rule on the LV request for extension of the date when its units should be equipped with devices which "effectively" restrict oil passage in the air systems (Rule 205f). The commission ordered that the date for compliance would be January 1, 1960, instead of June 1, 1959, as published in the original order.

Like New After



PROOF Unretouched photo shows typical traction motor pinion gear from Lehigh and Hudson River Railway Company locomotive after 8 years of service. Commenting on this, W. E. Burns, L and HR Mechanical Superintendent, says: "To date, all axle gears and traction motor pinion gears have shown very little wear. This proves to us the excellent lubricating properties of Sinclair Jet Lubricant TM."

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Sinclair Jet Lubricant TM is a rich, rugged Pennsylvania oil that cushions traction motor gear teeth, prevents undue wear and reduces excessive electrical loads. Now in use on over 100 American railroads, it's unsurpassed for heavy-duty work in Diesel traction motor gears.

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SINCLAIR RAILROAD LUBRICANTS

New turbine locomotive arrives at top of Union Pacific's Sherman Hill in Wyoming. Five locomotives delivered are on Council Bluffs-Ogden run.

Controls for 8,500-Hp Gas Turbines

Design goal was to make control as reliable as major components on new Union Pacific locomotives

FIVE OF THE FIFTEEN 8,500-hp gas-turbine-electric locomotives ordered from General Electric in 1955 are now in service on the Union Pacific. Despite the increase in power and size of the new units, control is quite similar to that of the original twenty-five 4,500-hp locomotive. There have been a number of interesting innovations.

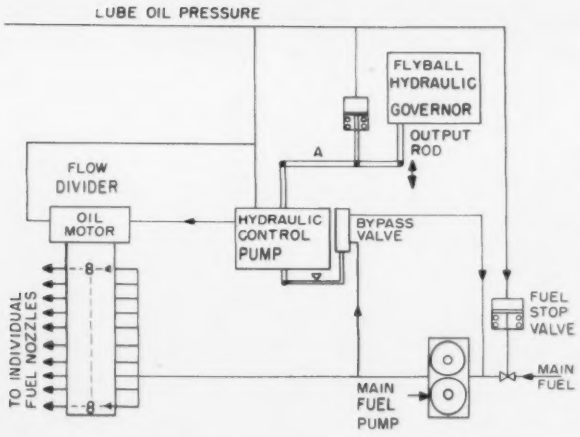
The new locomotives consist of three units: an auxiliary cab (the A unit), the power cab (B unit), and an insulated fuel tender which has been supplied by the UP. The auxiliary cab contains the engineman's controls, a diesel engine-generator, a radiator fan, and a traction motor blower. The d-c generator of the diesel engine set is used for hostling the light locomotive, cranking the turbine, exciting the traction motor fields during dynamic braking, furnishing make-up heat for the fuel tender, and cranking the diesel engine.

The second (power) cab consists of the simple-cycle, single-shaft gas turbine and four conventional d-c traction generators mounted in tandem pairs. Four exciters, two generator blowers and one traction motor blower are gear-driven from the ends of these generators. The turbine speed of 4,860 rpm is reduced through a gear box to 1,050 rpm for the generators.

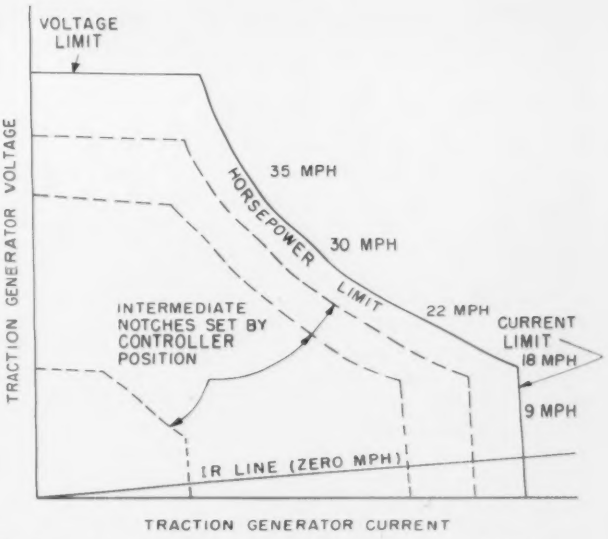
Each main power circuit on the first 8,500-hp locomotives consists of one generator and three motors permanently connected in parallel. Later locomotives employ an arrangement of six motors in parallel across two generators in series to improve utilization at high speed. This increases generator voltage from 800 to 1,200 volts. GE's newest 752 traction motors are being used. The traction generator characteristic is basically the same as that of diesel-electric locomotive generators.

Between current and voltage limits, the control system acts to produce a constant power output from the generator. The function of horsepower limit is particularly important on these locomotives because, under certain conditions of ambient temperature and altitude, the turbine is capable of delivering considerably more than rated output. Voltage, current and horsepower limits are all established by a reference which is set by the position of the engineman's throttle.

While the excitation control func-



Turbine fuel control has link A which is positioned by flyball governor. This varies displacement of hydraulic pump. Lube oil pressure acts on fulcrum of output lever.



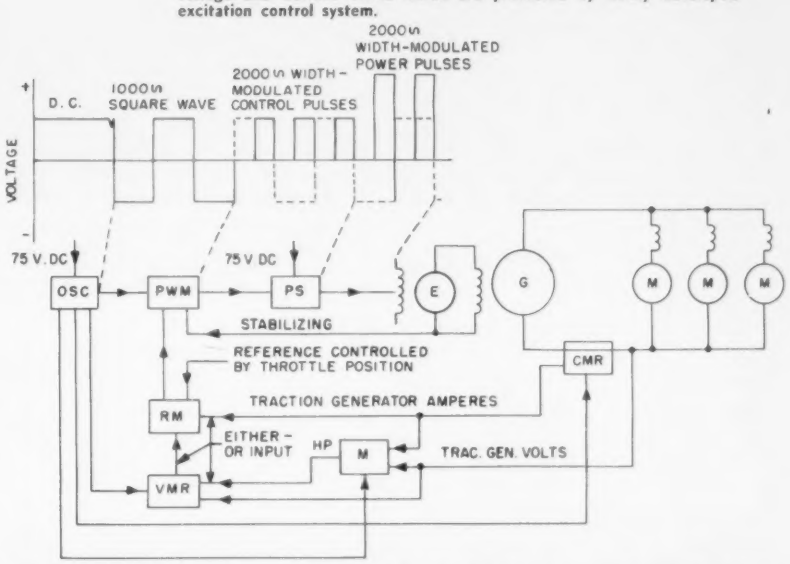
Traction generator characteristic resembles that for diesel. It has voltage and current limits which are protected by newly developed excitation control system.

tions are conventional, they are performed in a different manner than formerly. An oscillator (OSC) uses transistors to cyclically switch a d-c voltage to the primary of a transformer. The transformer secondaries provide square-wave a-c voltages which are used to perform the many functions throughout the excitation control.

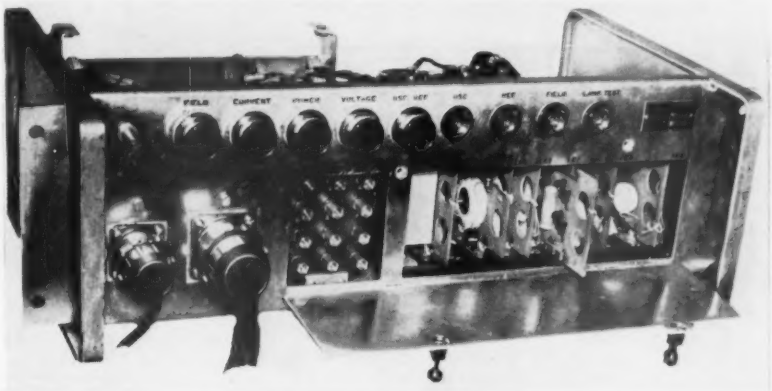
The pulse width modulator block (PWM) receives the a-c voltage from the oscillator, and in response to a small control signal, varies the width of its output wave between zero and 100 per cent. It is used to drive the power switch (PS), that cyclically switches the battery voltage to the pulse furnished by the PWM block. It is then possible to control the excitation of the exciter field between zero and some maximum value.

Traction generator output current is measured by a current measuring reactor (CMR) which receives a-c power from OSC. The output of CMR is proportional to traction generator current plus a preset function of traction generator voltage and is compared with a reference in the reference mixer block (RM). The reference is controlled by the position of the engineman's throttle. Traction generator voltage, fed to the function generator (FG), generates an output which is applied to CMR, adding to the generator current. The system regulates the output of CMR to a constant proportional to the input system reference, giving current and horsepower limit.

Traction generator voltage is measured by a voltage-measuring reactor



Schematic arrangement of excitation control includes the following components: OSC-Oscillator; PWM—Pulse Width Modulator Block; PS—Power Switch; VMR—Voltage Measuring Reactor; RM—Reference Mixer Block; FG—Function Generator; CMR—Current Measuring Reactor.



Excitation control panel has push-button, indicating-light type of trouble-shooting equipment. Individual functional packages, encapsulated and keyed, fit at right of panel.

(VMR). As the VMR output exceeds the reference, the error developed is fed to PWM to further reduce the width of the output pulse and the exciter field current, regulating to a "called for" voltage limit.

An air-driven controller with the necessary mechanical interlocking produces the proper starting sequence. There are only three time-delay relays. The turbine starting sequence begins when the diesel-driven generator is coupled to one of the main traction generators acting as a shunt motor. At the end of a fixed time, if a certain minimum speed has been reached, the turbine controller moves to the next position. This turns on starting fuel, energizes the spark plug, and admits atomizing air from the diesel-driven compressors. If the flame detector indicates that combustion has taken place within 90 sec, the controller again advances and initiates full cranking of the turbine. Fuel supply is restricted initially to allow for warm-up. At the end of the warm-up period, fuel is increased so the turbine begins to accelerate itself, and the cranking motor field is weakened as the controller continues to advance. At 55 per cent speed the turbine is self-sustaining. Total cranking period to make the turbine ready for load averages 9 min. Fuel transfer from diesel to Bunker C takes place after cranking has ceased if the heavy fuel is hot enough to permit the change. Although new to gas turbine locomotive practice, experience has shown it necessary to rotate the turbine rotor while cooling after shutdown.

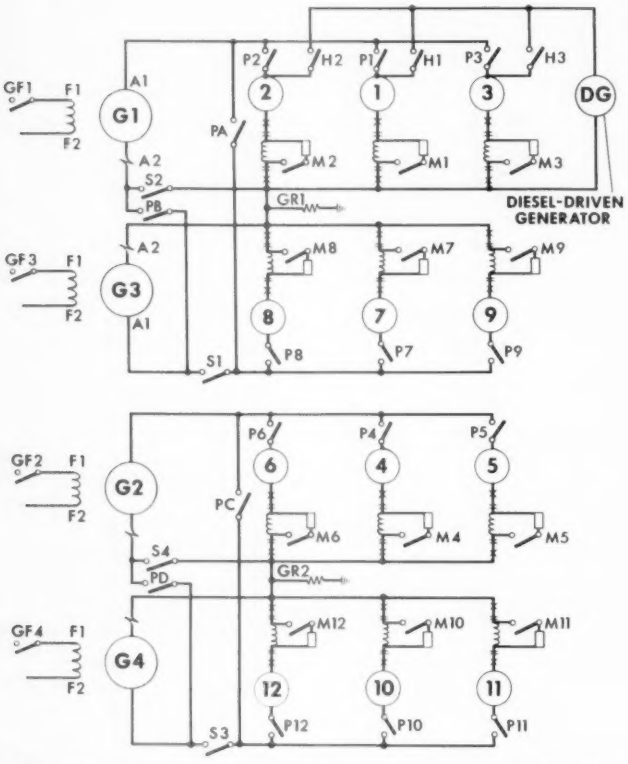
Fuel Control

Fuel control is effected through a fly-ball governor which varies the displacement of an hydraulic control pump. This varies the speed of the hydraulic motor on the flow divider. Pressure to force the fuel through the fuel nozzles is supplied by the main fuel pump. Ten gear pumps in the flow divider act to meter the fuel and adjust the pressure to suit conditions at individual fuel nozzles.

Power output of the turbine is determined by exhaust gas temperature. If this becomes excessive, the load on the turbine must be reduced. The control acts to accomplish this by limiting the fuel and this also causes the governor to operate an electric load-reducing device. Exhaust temperature is measured by two thermostats in the exhaust zone.

Turbine shutdown is automatically initiated by any of the following: turbine overspeed; low lubricating oil pressure on the turbine or diesel engine; high lubricating oil temperature; high turbine exhaust temperature; or loss of battery charging. Warnings are provided at the engineman's position to indicate unusual turbine vibration, fire in the turbine area, low main fuel pressure or temperature, unusual operation of the lubricating oil pump, wheel slip, and ground relay action.

Experience has shown that the general-purpose, industrial-type control has usually required extensive modification to render it adequate for the rigors of locomotive service. This fact is brought out most forcibly on the gas turbine electric locomotive with its single power plant. The objective of the new design has been to make the control as reliable as the major locomotive components. As this is achieved, it will improve locomotive availability and permit the high monthly mileages which are necessary to fully realize the potential advantages of gas-turbine-electric locomotive operation.



OPERATING SPEED (MPH)	TRI, TR2	MI-MI2	GFI-GF4	PI-P6	P7-P12	SI, S3	S2, S4	PA, PC	PS, PD	ELRI-ELR4	TDI, TD2	FSI, FS2	TRII, TRI2	MAIN GEN. LIMIT
LO (0-31)			●	●	●	●	●							800 V
SHUNT (31-42)			●	●	●	●	●					●		4800 A
		●	●	●	●	●	●					●		
HIGH (42-65)	●	●	●	●	●	●	●					●		1200 V
FORWARD	●	●	●	●	●	●	●					●	●	3000 A
TRANSITION	●			●	●		●		●		●	●	●	
	●			●	●			●		●	●	●	●	
	●			●	●			●	●	●	●	●	●	
	●			●	●			●	●	●	●	●	●	
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	●		●	●	●			●	●	●		●	●	
HIGH (42-65)			●	●	●			●	●	●		●	●	1200 V
BACKWARD			●	●	●			●	●	●		●		3000 A
TRANSITION			●	●	●				●	●		●		
			●	●	●	●			●	●		●		
			●	●	●	●				●		●		
			●	●	●	●	●					●		
		●	●	●	●	●	●					●		

Schematic shows arrangement of generators and motors on last turbine locomotive to be delivered. This arrangement was developed to make possible higher speed operation with these big freight locomotives. Subsequent units will get this system.

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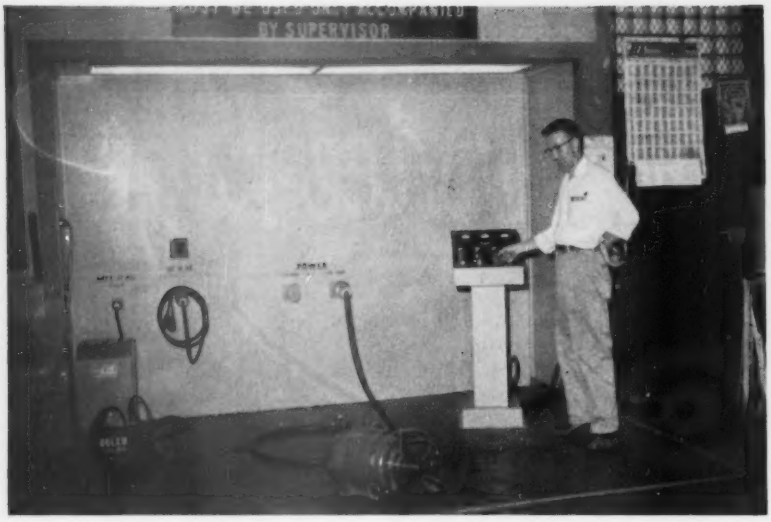
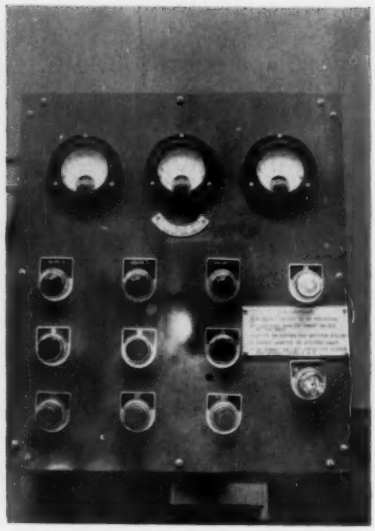


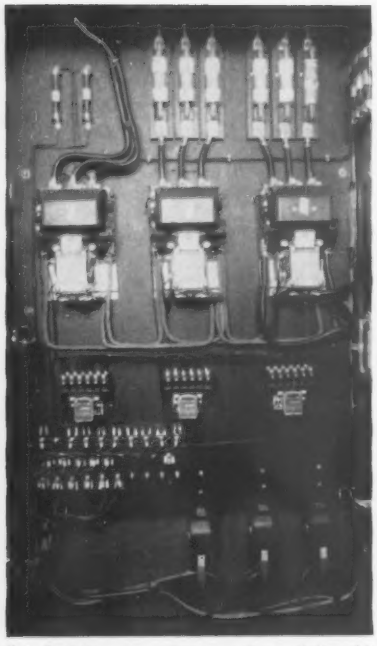
Both the motor under test and the recently developed control stand are on flexible cables so they can be placed conveniently within the specially equipped work area. This high-voltage test equipment is to be operated only in the presence of an electrical supervisor.



Control has buttons for three voltages, lights indicating closed switch, ammeter for each circuit, and main switch with Yale lock.

Power Supply for Testing A-C Equipment

Safety, convenience and protection of instruments are assured by test board developed on the Great Northern



Principal items on the control panel for this high-voltage testing installation are three interlocked switches (at center) and the three clamp-on ammeter coils at bottom of board. Each of the switches controls one of the a-c voltages. Entire installation was developed and built by GN men at the Dale Street Shop in St. Paul, Minn.

In the Dale Street Shops of the Great Northern at St. Paul, Minn., there is a test board with circuit controls which greatly facilitates the testing of 110-, 220- and 440-volt a-c equipment.

The control board is on a stand at the end of a portable cable so that it may be placed close to the apparatus being tested. The power for testing is obtained from either of two receptacles in a dead-front board, and it is carried to the equipment on test by a flexible cable. There are no exposed test circuits. Even the test clamps are covered with rubber nipples.

The three instruments at the top of the control board are six-scale ammeters, one in each current leg. The scales are 10, 25, 50, 100, 250 and 500 amp. The lever under the center meter changes the ranges of all three ammeters simultaneously. It is interlocked with the switches so that no switch can not be closed unless the meters are all on the 500-amp scale. This protects them from accidental burnout which might be caused by inrush current.

At the lower right on the control board is the main switch control button which permits the closing of any of the three power circuits. It may be operated only after it is released with a Yale key. Immediately above it is an indicator lamp which lights when the switches are unlocked. At the left of the switch lock indicator lamp are three more which show respectively if the test power being used is 110, 220 or 440 volts. The three pushbuttons below these lamps are used to select and connect the kind of power wanted. The lower three buttons open the circuits. All are interlocked so that only one circuit may be closed at a time.

The test procedure is as follows:

1. Turn key to "on" position.
2. Place ammeter range switch at 500 amp.
3. Press "on" button for desired voltage.
4. Switch ammeters to desired range.
5. To change voltage, press "off" button and repeat items 2, 3 and 4.

Back of the dead-front panel is a control cabinet. Under the fuses at

the top are three 3-phase contactors. These open and close the three power circuits selectively. When one is closed, its back contact is closed. This energizes the control relay below it, and this sets up circuits which make accidental closing of the other circuits impossible.

There is a clamp-on meter coil on each main current leg. Each of the three coils feeds one of the rectifier type ammeters on the control board. A bar across all three ammeters permits the range lever to operate all three range scales simultaneously.

There are two power receptacles in the front of the dead-front board. One is fused for testing small machinery safely and the other for 150 amp. A typical test is that of running diesel locomotive ceiling fans. They are run for about half an hour to determine if bearing noise or temperature rise is excessive.

The stand is used to test a-c equipment received from all over the railroad. In addition to three-phase a-c power, the board also supplies 32 volts d-c and a 440-volt outlet for charging truck batteries.

More Converts for D-C Hi-Potting

High-voltage d-c testing is now finding wide application in railroad service. Users, however, are still somewhat uncertain, as to how to use it and what to expect. It has been used for some time in the power industry. There its application has proceeded at a slower rate because large and expensive machines are involved and a possible power failure could involve both high costs and embarrasing situations.

An outline of how utilities are using high-voltage d-c testing is included in a survey prepared recently by A. A. Milusich, division engineer, Consolidated Edison Company, New York. In response to questions users replied as follows:

	Per Cent Yes	No
1. a) Do you use high-voltage d-c for testing the insulation of rotating machines?	31	69
b) For routine maintenance tests?	58	42
c) For special investigations?	74	26
2. What is your overall opinion of high-voltage d-c testing? Are you satisfied and do you intend to continue its use?	100	0

Of more interest to this discussion are the comments made by the various users, as follows:

- "We believe it provides the most information with the least amount of equipment and the least risk."
- "We are of the opinion that, while not all conclusive, the d-c high voltage test procedure provides the best measure of insulation dielectric condition and probable insulation life that has been developed to date. It is best because it provides an indication of insulation condition without necessarily exposing that insulation to disruptive or destructive potentials."
- "We feel that it is advantageous in that it is nondestructive (limited current, controlled voltage); test equipment is compact, portable and simple to operate. We feel that d-c is more searching and may prevent unexpected shut downs. We feel that curve history is a good indication of life expectancy of insulation."
- "It is our practice to take three dielectric absorption curves; one at 1,000 volts d-c for 10 minutes, one at 5,000 volts for 10 minutes and, if these are satisfactory, a final proof test at rated volts x 1.25 x 1.4 for 5 minutes. The curve shapes and relative values of the data are carefully compared and held for comparison with other similar data taken earlier."

The Other Side

These obviously are from users who favor d-c testing and may be considered as *pro* comments, as far as the survey was concerned. The following comments are not *con* but more in the nature of those on the fence:

- "We are not ready yet to extend its use from special tests to routine tests."
- "We have not come to a definite conclusion as to the value. We are in the process of compiling data which we may evaluate in the future."
- "The position of our company is as follows: a) We used d-c for dielectric testing not only for large motors and generators, but for transformers, switchgear and circuits. b) We have been using d-c since 1926. c) Our test voltages are at moderate levels. d) We have obtained satisfactory results by using d-c."
- "High voltage d-c testing is not yet an established standard schedule maintenance procedure. It has been carried out in special cases where doubt existed of insulation conditions. It is possible that a standard scheduled test procedure will be established."
- "Our experience with d-c testing is limited, and we are at present gathering a background of information. From our experience so far with d-c testing we have found that:
  a) The accurate measurement of leakage current of the order of a few micro-amps is too difficult for a field test.
  b) The measurements require too much time.
  c) Preparation necessary to prevent corona from the terminals at the top test voltages are too elaborate.
  d) Prognostication of breakdown level from current on megohm vs: voltage curves has been totally unsuccessful."

Some further confirmation of the value and acceptance of high-voltage, d-c testing is indicated by the fact that a comprehensive paper which describes new developments in the field, which was presented as a "conference" paper at a Land Transportation meeting, American Institute of Electrical Engineers in 1958 was elevated to the status of a "Transactions" paper at the 1959 AIEE meeting, February 6, 1959. The substance of this paper appeared in the May 1958 issue of Railway Locomotives and Cars.

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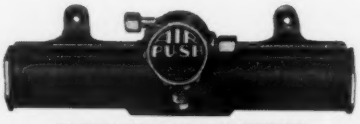

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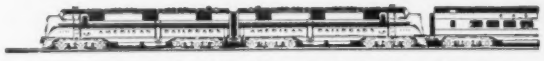

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Report

(Continued from page 8)

Joint ASME-AIEE Railroad Conference

The program for the joint Conference of the American Society of Mechanical Engineers, Railroad Division, and the American Institute of Electrical Engineers, Land Transportation Committee, which will be held at the Hotel Sheraton, Chicago, April 8 and 9, is as Follows:

WEDNESDAY, APRIL 8

9 a.m.

Freight Car Tractive Resistance Measurements by Doppler Radar, R. D. Campbell, Union Switch & Signal Co.

A Method for Automatic Control of Car Retarders, H. C. Kendall and J. H. Auer, Jr., General Railway Signal Co.

An Automatic Speed Control System for a Gravity Freight Classification Yard, R. J. Berti, electrical engineer, Union Pacific and T. J. Dosch, Reeves Instrument Corp.

1:30 p.m.

Technical Research on European Railroads, P. V. Garin, engineer research and mechanical standards, Southern Pacific.

Freight Car Roller Bearing Capacity Effect on Life, A. D. Edelman, Hyatt Bearings Division, General Motors Corp.

Machinery for Mechanized Railway Maintenance, G. M. Magee, Association of American Railroads.

THURSDAY, APRIL 9

9 a.m.

Corrosion Effects on Railway Equipment, E. A. Foster, Association of American Railroads.

Characteristics of New Lightweight Commuter Cars, J. W. Horine, electrical engineer, Pennsylvania.

Tiedowns for Piggyback Operations, J. A. Gower, assistant mechanical engineer, Pennsylvania.

1:30 p.m.

Multiple-Unit Operation of Diesel and Electric Units on the Milwaukee, L. Wiley, consulting electrical engineer.

Detector Car History and New Developments, H. W. Keevil, Association of American Railroads.

New Wheel Slip-Slide Detection and Correction System, W. B. Zelina, General Electric Co.

From May 11 to 13 another ASME-AIEE joint conference will consider the progress being made in automatic controls and their applications in industry. This Second Annual Joint Conference on Automatic Techniques will be held at the Pick Congress Hotel in Chicago. On May 12, V. E. McCoy, chief purchasing officer of the Milwaukee, will speak on "Automation in Railroading."

Supply Association Changes Name

At a special meeting of the Board of Directors of the Railway Electric Supply Manufacturers Association in February, the members voted to change the name of the organization to the Railway Electrical and Mechanical Supply Association. In recent years, the Association has been host to the members of the Mechanical Division of the Association of American Railroads, and the Electrical Section, Engineering and Mechanical Divisions at their annual meetings. On years when the Association has sponsored an Exposition, exhibits of electrical materials have been displayed. The broadened scope of the organization now permits membership of mechanical supply companies. Future expositions will include both electrical and mechanical exhibits of interest to railroad visitors.

Russia Has Train With Robot Controls

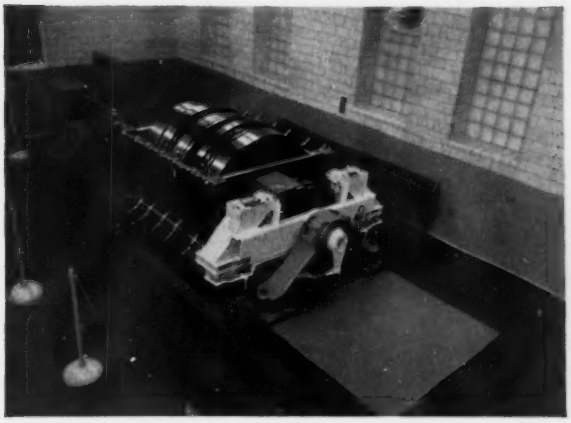
Russia has successfully operated a three-car electric train with robot controls. The magazine USSR reports that the robot engineer includes a computer with stored data on grade, length of line, and similar fixed information. Train speed, distance traveled, and other variables are fed to the computer automatically as the train proceeds. Special transmitting elements are located on the axle.

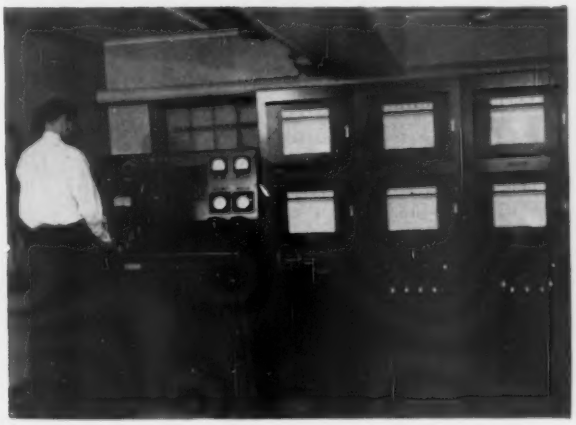
Personal Mention

Canadian National.—*Montreal:* RONALD W. CAPPER appointed diesel supervisor, Maritime district. J. GILBERT LEBLANC appointed inspector of shop methods succeeding Mr. Capper. *Moncton, N.B.:* W. A. MACDONALD appointed general foreman freight-car shop. Formerly foreman at Calder, Alta., shops.

Canadian Pacific.—*Montreal:* E. W. MORRIS appointed engineer of car equipment, succeeding Charles Hassell, retired. A. TEOLI appointed assistant engineer of car equipment, succeeding Mr. Morris. Mr. Teoli formerly assistant engineer, office of chief of motive power and rolling stock.

Chicago & Eastern Illinois.—*Dolton, Ill.:* CARL H. SPIERING, assistant general freight-car foreman at Yard Center, appointed general freight-car foreman, succeeding





This inertia dynamometer is the second installed in the research laboratory of the Air Brake Division of the Westinghouse Air Brake Company at Wilmerding, Pa. The control board and recording panels (right) are in a fully enclosed control room, from which the dynamometer can be observed through a window. The dynamometer will be used to test all types of braking mechanisms, also to test Cobra composition brake shoes, a joint development of WAB and Johns-Manville Corporation. It consists of a large flywheel made up of a number of steel discs of various weights and a railroad car wheel, motor driven on the same shaft. The inertia of the machine may be changed to simulate various vehicle weights by selecting the steel discs to be rotated. Application of brake shoes to the wheel creates the retarding force to brake the simulated vehicle. By the addition of a jack shaft, a scond wheel can be mounted and comparative tests run simultaneously on various types of braking mechanisms and on the same or different compositions and materials. Braking force, speed, temperatures developed, retarding force, stopping distance, and time are instrument recorded. Precise speed regulation is accomplished by an electronic control which compares a feed back signal to a reference. Maximum speed is 1,500 rpm, permitting test stops from 160 mph for any vehicle, including the heaviest locomotive. The machine cost approximately $500,000.

John W. Burch, retired. Position of assignant general freight-car foreman abolished.

Norfolk & Western.—*Crewe, Va.:* W. S. LYON, enginehouse foreman, appointed general foreman, succeeding L. E. BERRY, retired. Roanoke, Va.: R. L. BRADLEY appointed yard foreman, succeeding V. G. ADAMS, retired. H. R. PEDIGO appointed assistant foreman, succeeding Mr. Bradley. FRANK WHITE, assistant foreman erecting shop, appointed gang foreman, Roanoke shops, succeeding Mr. Pedigo. *Lamberts Point, Va.:* S. L. WOHLFORD appointed enginehouse foreman, succeeding DAVID BLANFORD, retired. P. C. HOUSMAN appointed assistant enginehouse foreman, succeeding Mr. Wohlford. Mr. Housman formerly assistant foreman. *Bluefield, W. Va.:* C. W. LEWEY appointed assistant road foreman of engines, Norfolk Division. C. L. VIAR appointed day enginehouse foreman, succeeding Mr. Lewey. Mr. Viar formerly assistant enginehouse foreman.

Pennsylvania.—*Buffalo, N. Y.:* LEONARD T. APPLE appointed supervisor of car equipment, Northern region. Formerly assistant superintendent of shops at Pittsburgh.

Seaboard Air Line.—*Richmond, Va.:* A. W. LEITNER, assistant superintendent car department transferred from Jacksonville, Fla. to Richmond.

Southern.—*Greenville, S. C.:* VERNON G. FAISON appointed road foreman of engines. Spencer, N. C. KEITH E. MEAD appointed road foreman of engines, succeeding Mr. Faison.

OBITUARY

Lee Robinson, 75, retired general superintendent of diesel power and equipment, Illinois Central, died January 10 in Illinois Central Hospital, Chicago.

Supply Trade Notes

WESTINGHOUSE AIR BRAKE COMPANY.—*Herbert A. May,* senior vice-president, retired.

■

NATIONAL MALLEABLE & STEEL CASTINGS CO.—*Lovell Shockey,* development engineer, Industrial Division, appointed sales manager, Cleveland Works, succeeding *Donald L. Griffith,* appointed sales coordinator. *Leslie N. Schuman* heads new product engineering department, Industrial Division. *Charles Schneider,* sales representative, succeeds Mr. Schuman as general superintendent, Cleveland Works. *Robert D. Everett* appointed general superintendent, Melrose Park Works.

Frank U. Hayes
Sperry Products

W. A. Baldwin
Stran-Steel

SPERRY PRODUCTS, INC.—*Frank U. Hayes,* appointed president and general manager, as noted in February issue, became sales manager of the Bullard Company in 1947; a director in 1950; vice-president in charge of sales in 1951, and assistant general manager in 1955. He remains with Bullard as board chairman and in a consulting capacity.

■

STRAN-STEEL CORPORATION.—*William A. Baldwin* appointed vice-president, Transportation Products Sales. Mr. Baldwin formerly sales manager at Detroit.

■

AEROQUIP CORPORATION.—A new warehouse opened at 635 N.W. 16th ave., Portland, Ore., to serve railroad and other industries in the Northwest. *Peter S. Naimo,* manager.

■

YOUNGSTOWN SHEET & TUBE CO. —*Robert W. Walling,* assistant manager, appointed manager of high strength (Yoloy) sales, Youngstown, Ohio. *Robert B. Davidson,* Cleveland district sales office, appointed assistant manager of Yoloy sales, Youngstown. *Frank A. Anderson,* from Chicago district sales office, appointed district sales manager, St. Louis. *John C. Clark* appointed assistant district sales manager, New York. *William E. Fender,* appointed assistant district sales manager, Indianapolis, Ind.

■

POOR & CO., PEERLESS EQUIPMENT DIVISION.—*Paul A. Cavett* and *Stanford C. Nelson* appointed sales representatives, and *Jack S. Johnson,* field engineer. Mr. Cavett formerly vice-president, Equipment Research Company; Mr. Nelson, formerly in sales department of Pullman-Standard Car Manufacturing Company, and Mr. Johnson formerly mechanical inspector, Pullman Company.

■

BETHLEHEM STEEL COMPANY. — Sales department moved from 25 Broadway to 375 Park avenue, New York 22.

■

WYANDOTTE CHEMICALS CORPORATION.—*James L. Ramsey,* appointed New England district sales manager at Boston, Mass. *Joseph M. Mann,* special representative—railroads, appointed railroad sales manager at Wyandotte, Mich., succeeding Mr. Ramsey.

■

SKF INDUSTRIES, INC.—*F. Harold Williams,* manager railway sales department at Philadelphia, appointed general manager of newly created Hornell (N.Y.) division.

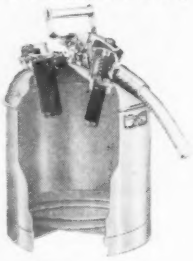
Quality cans
EAGLE SAFETY CANS

The approved *safe* way to handle flammable liquids • Listed by Underwriters Laboratories • Approved by Factory Mutual • Uncommonly rugged for hard use • 'The Complete Line'

STYLE I
STORAGE CAN
1 qt., 2 qt., 1 gal. sizes with trigger-grip handle . . . 2½ gal., 5 gal. sizes with free-swing handle . . . valve operated by handle gives positive pouring control . . . no waste, no splash, no spill . . . strong quality construction.

ORDER FROM *YOUR SUPPLIER*

STYLE II
FILLER-DISPENSER CAN
2½ gal., 5 gal. sizes with free-swing handle . . . flexible spout for easy pouring . . . body and breast each seamless drawn from heavy 24-gauge steel . . . steel hoop reinforces bottom . . . fire screens in pour spout and filler opening for double fire protection.



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EAGLE MANUFACTURING CO. Wellsburg, W.Va.
Serving Industry Since 1894

CONSOLIDATED FOUNDRIES & MANUFACTURING CORP. — *Robert N. Janeway* appointed vice-president engineering. Mr. Janeway and Adirondack Steel Division of Consolidated Foundries have been engaged for more than a year in a development program on new trucks for diese-electric locomotives, railway passenger cars, and transit cars. This program now to be intensified and carried on in Detroit offices and laboratory of Mr. Janeway's own engineering firm, Janeway Engineering Company.

■

MORRISON INDUSTRIES, INC.—*Morrison Industries, Inc.*, with *George Kass* as president and general offices in Buffalo, N.Y., has taken over manufacturing operations of *Morrison Railway Supply Corporation* and the plant of the *International Railway Car Company* at Kenton, Ohio. Morrison Railway Supply will continue to handle the Metalweld Process, and the Kenton plant will operate as the *International Car Division of Morrison Industries*, under *B. J. Yelin*, vice-president, producing railroad cabooses and Campcars. The *International Railway Car Leasing Company*, with *R. L. Morrison, Jr.*, and *Theodore Jewett* as vice-presidents, will handle the leasing of reconditioned freight cars.

■

AMERICAN STEEL FOUNDRIES. — *Joseph B. Lanterman*, vice-president, elected president and chief executive officer, succeeding *Charles C. Jarchow*, elected chairman of the board.

■

DANA CORPORATION. — *Dale W. Toms* appointed sales engineer.

■

PULLMAN-STANDARD CAR MANUFACTURING COMPANY. — *Fred W. Bainbridge*, assistant vice-president, appointed assistant vice-president and sales manager, railroad division.

■

INLAND STEEL COMPANY.—*John F. Smith, Jr.*, elected president. *Robert M. Buddington*, general manager of sales, appointed vice-president in charge of sales, succeeding Mr. Smith.

■

DUFF-NORTON COMPANY.—*A. M. Kelly* appointed district sales manager in San Francisco.

■

FINE ORGANICS INC.—Executive and sales offices moved from New York to plant at 205-225 Main street, Lodi, N.J.

■

ARCHER - DANIELS - MIDLAND COMPANY.—*North American Supply Company*, Cleveland, appointed regional sales representative for Freight Liner System for upgrading freight and covered hopper cars.

OBITUARY

MERVYN H. McCURDY, sales manager, Southeastern district, Baldwin-Lima-Hamilton Corporation, died in North Carolina on February 1. Mr. McCurdy entered Transportation Department of Baldwin Locomotive Works in 1915 and during the 1930's and 40's was a sales engineer.

It's What they DON'T DO that CUTS YOUR OPERATING COSTS!

Actually, the most important thing a diesel electric brush can do is to do nothing that will cause you a lot of extra commutator reconditioning costs. And that's exactly what Stackpole Brushes are designed for in fullest measure.

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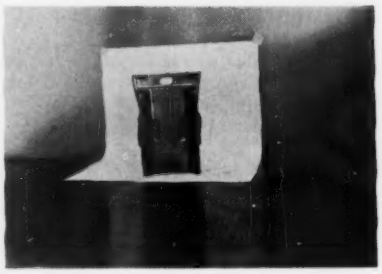
What's New

(Continued from page 10)

weighs only 2¾ lb and will deliver 95 ft-lb of torque.

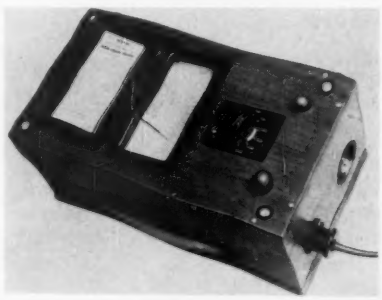
All wrenches are reaction balanced to reduce operator fatigue. *Albertson & Co., Dept. RLC, Sioux City, Iowa.*



Wedge Reclamation

A process developed to reclaim worn forged carbon-steel journal-box wedges is expected to offer substantial savings to the railroads over previous reclamation by welding and grinding. Patents are pending on this reclaimed wedge, and AAR approval has been received.

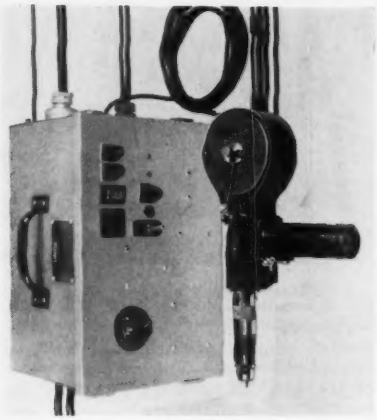
The worn wedge is heated and reshaped in a die. Metal displaced by the die from the 1⅝-in. x 1⅜-in. x 3/16-in. pockets on the inner sides of the wedge flows in all directions, replacing that lost through wear and bringing the wedge back to its original contour. After forging, the flashing is trimmed off in a trimming die. Dies are presently available for reclaiming the 5½ x 10 wedge. *Keystone Railway Equipment Company, Dept. RLC, 80 E. Jackson blvd., Chicago 4.*



Insulation Resistance Tester

New rectifier-operated Megger insulation resistance tester is intended for making step-voltage tests on equipment in the range of 300, 600, and 2,500-volt classes. It consists of a dry-type rectifier with magnetic input voltage stabilizer and a

crossed-coil ohmmeter measuring element installed together with operation controls, indicators and safety devices in a rectangular teakwood case with rubber feet and leather carrying strap. Output voltages are 500, 750, 1,000, 1,500, 2,000 and 2,500, with a range of 0-10,000 megohms. The scale of the instrument is protected by a hinged metal cover, and the plug-in generator is rectifier operated. *James G. Biddle Company, Dept. RLC, 1316 Arch street, Philadelphia 7.*



Torch for Manual "Sigma" Welding

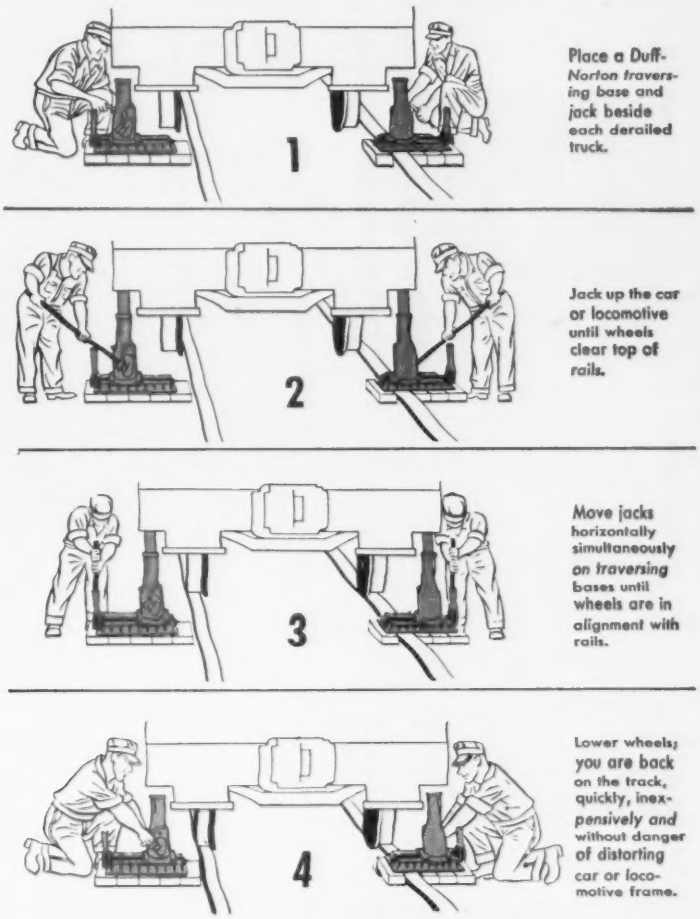
The Sigmette torch, designed for welding jobs where maximum portability of equipment is required, weighs 3 lb; the control box, less than 20 lb. It is rated at 200 amp and will handle the full welding range with 3/64-in. aluminum wire; applications on aluminum .093 to ⅛ in. thick using .030-in. wire up to 125 amp.; limited applications with 1/16-in. aluminum wire, and .0030-in. carbon-steel wire. Torches are available for the full welding range with either .030 or 1/16-in. aluminum wire. The wire spool mounted right on the torch lets the operator get at jobs in confined spaces and areas remote from power and gas supply. The torch and component control are completely insulated. *Linde Company, Division of Union Carbide Corporation, Dept. RLC, 30 East 42nd street, New York 17.*

Vertical Movement Car Hoists

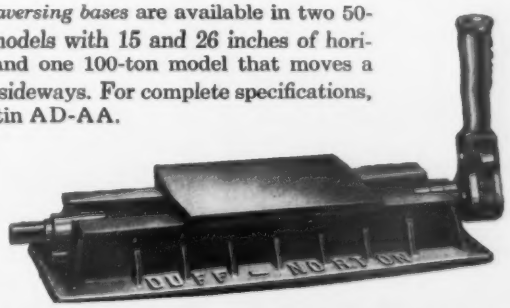
Ten specially designed tank-car lifts have been installed in the circular repair center of the Union Tank Car Company at Baton Rouge, La. These heavy capacity hydraulic lifts permit operations on undersides of tank cars without the need of overhead hoist mechanisms, and no jacking pads obstruct the work area. Each lift is mounted on a power-driven carriage that traverses horizontally within a

How to get back on the track quickly

Without A Crane!


1
Place a Duff-Norton traversing base and jack beside each derailed truck.
2
Jack up the car or locomotive until wheels clear top of rails.
3
Move jacks horizontally simultaneously on traversing bases until wheels are in alignment with rails.
4
Lower wheels; you are back on the track, quickly, inexpensively and without danger of distorting car or locomotive frame.

Duff-Norton traversing bases are available in two 50-ton capacity models with 15 and 26 inches of horizontal travel and one 100-ton model that moves a load 20 inches sideways. For complete specifications, write for bulletin AD-AA.



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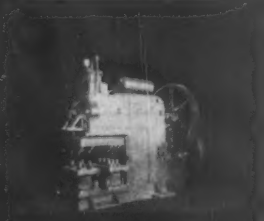
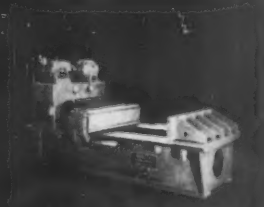


HEAVY DUTY PUNCH

Punch 34 patterns without tool change — 2½" hole through 1½" steel or a number of smaller round or shaped holes. Handles 65 ft. stock.



HORIZONTAL BULLDOZER

200-ton press features rapid production and return speeds for heavy forming, flanging, bending. Compact machine requires minimum floor space — boosts output.

CO-PUN-SHEAR

3-in-1 machine speeds repair work — copes, punches, shears without changing tools. Handles about 90% of the miscellaneous work in the average repair shop.

When "CUT COSTS" is the order of the day, look to Beatty heavy metal-working equipment to brighten your profit picture. Punching, slotting, bending, flanging, forming, shearing — whatever your metal-working job, Beatty machines are engineered to give you fast, accurate production.

But you will never know the costs you can save — the manpower you can save until you put a Beatty machine to work in your shop. For either 24-hour-a-day operation or intermittent use, they're bears for work — require a minimum of maintenance, reduce downtime — cut costs on any metal-working job.

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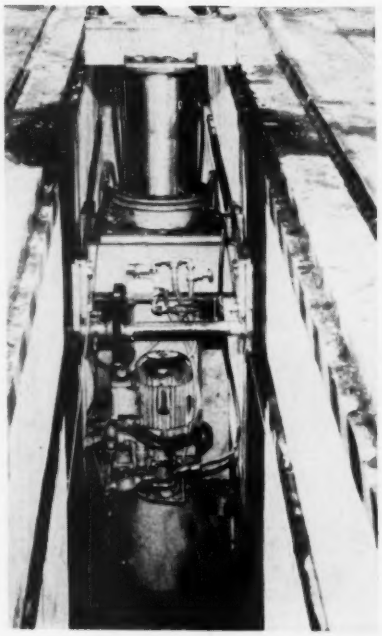
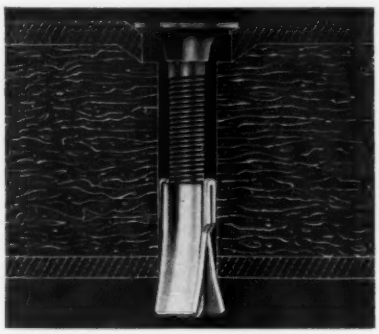


pit approximately 33 ft long. This permits automatically moving the lift to any part of a tank car undersection. Both vertical lifting and horizontal movement of the lifts are remotely controlled by push-button operation from utility stations adjoining the work area. The lifts can be raised 3 ft 5 in above pit-top level under a 36,000-lb load. *Autoquip Corporation, Dept. RLC, 1140 S. Washtenaw, Chicago 7.*

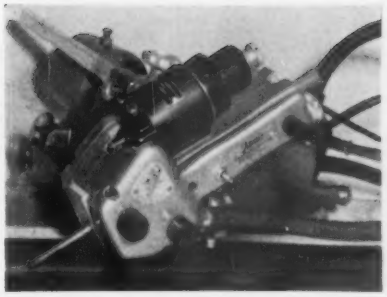


Self Locking Bolt

The Empeco self-locking sleeve bolt is designed for any wood to steel or steel to wood application. It has a standard carriage bolt head and a split sleeve nut that expands and locks as the bolt is screwed into position. The 500 Series is said to bring higher quality and lower costs in the construction and repair of freight and refrigerator cars, as well as in the installation of steel floor plates. The bolt assembly is corrosion proof, and no special tools are needed for its installation. *Essential Mechanical Products & Equipment Co., Dept. RLC, 156 Hawthorne street, Elmhurst, Ill.*

Insulation Tester

The Model 4501 35-kv automatic insulation materials tester meets requirements of some 30 ASTM specifications for electrical insulating materials, such as varnishes, paper, tape, glass, phenolics, and rubber in tubes, sheets, etc. The output terminates in a test fixture contained in a transparent, safety interlocked test cage. Additional interchangeable plug-in testing fixtures are available. The tester features motor driven rate-of-rise with manual override and return of output voltage. The panel has a 4½-in. kilovoltmeter connected directly across output for accurate test voltage measurement. *Associated Research Inc., Dept. RLC, 3777 West Belmont ave., Chicago 18.*



Automatic Torch

The Model Q-3 automatic Arcair torch meets a need for automatic joint preparation. It consists of a head with an electrode feed mechanism which feeds consumable copper-coated carbon-graphite electrodes as required and supplies a jet of air at the proper location.

The head is mounted on a tractor, permitting straight-line or circular travel at predetermined speed. The tractor has a speed range of 0-180 in. per min. Where work is positioned, the Q-3 head can be removed from the tractor and mounted on the positioning equipment in the same manner as an automatic welding head. The head can be set at any angle with the work to produce a variety of grooves and bevel contours. It will handle copper-clad Arcair electrodes from 3/16 to ¾ in. diameter, inclusive. *Dept. 137, Arcair Company Dept. RLC, Lancaster, Ohio.*

HELPS FROM MANUFACTURERS

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by suppliers to the railroad industry. To receive the desired information write direct to the manufacturer.

ADJUSTABLE RIPJACKS. 4-page Bulletin RJ-C-100 describes Whiting Ripjack which permits cars of any width to be serviced, also Trackmobile-Adjustable Ripjack combination for handling bad-order cars. (Write: *Whiting Corporation,* Dept. RLC, 157th and Lathrop ave., Harvey, Ill.)

AIR DUMP CARS. 6-page folder describes and illustrates features of Magor air dump cars. (Write: *Magor Car Corporation,* Dept. RLC, 50 Church st., New York.)

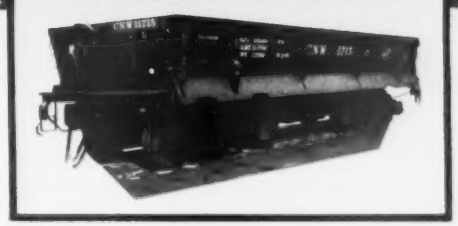
INSULATING PRODUCTS. 24-page 3M catalog contains descriptions and applications for both Scotch brand and Irvington brand electrical products for splicing and terminating wires and cables—tapes, connectors, splicing kits and materials, epoxy, resins, etc.—(Write: Dept. 49-37, *Minnesota Mining & Manufacturing Co.,* Dept. RLC, 900 Bush ave., St. Paul 6, Minn.)

HOISTS AND CRANES. 8-page folder, DH-28, illustrates Wright line of motor-operated and hand-operated hoists, and jib, hand-traveling, and motor-driven cranes. (Write: *Wright Hoist Division, American Chain & Cable Co.,* Dept. RLC., York, Pa.)

UNITIZING FREIGHT CAR ROOF SECTIONS. Ideas-In-Action Report (U6-20) describes method of unitizing freight-car roof sections with heavy duty Acme steel strapping. (Write: *Acme Steel Company,* Dept. RLC, 135th st. and Perry ave., Chicago 27.)

RAILROAD FORGINGS. 28-page pocket-size catalog describes and pictures upset forged products for maintenance of way, rolling stock, and bridge construction and repair. (Write: *Commercial Shearing & Stamping Co.,* Dept. RLC, Youngstown 1, Ohio.

MAGOR AIR DUMP CARS



New Magor Air Dump Cars are designed to take the toughest punishment—and keep rolling!

Actual performance records prove that the cost of replacement parts furnished by Magor equals less than 1/10th of 1% of the purchase price per car, per year!

For dependability and low operating costs, you can't beat the rough and ready ruggedness of America's leading air dump car—by Magor.

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MAGOR CAR CORPORATION

50 Church Street
New York 7, N.Y.

GEAR UP! WITH X-4 4 TIMES THE POWER!

Take a close look at what this rugged, dynamic head wrench can actually do for you. Consider the fact that with the X-4 **one man** can easily and quickly deliver maximum tightness to a threaded fastner—in less time and with less effort than would formerly be required by **four men.** Consider the fact that with the X-4 the threat of sudden, dangerous releases is removed. And this versatile utility tool imparts a smooth, steady pressure to the tightening of the widest variety of threaded parts—nuts, bolts, caps, etc.

This is the safe way to save. It isn't just that workmen no longer have to knock themselves out in the old way when they're using the X-4. Look—since frozen threads are easily loosened when the X-4 is used, it's no longer necessary to bang away with a hammer. A danger to workmen and costly damage to equipment is thereby avoided. The X-4, requiring limited space, capable of replacing conventional wrenches everywhere, easily dismantled in a matter of seconds, is one of the most valuable assets to your Repair and Maintenance Departments that could be imagined.

Remember the powerful X-4 costs only little more than conventional hand tools—**much less** than any comparable power tool. The forceful X-4 Geared Head Wrench can really save for you. Find out more about it—**today!**

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West Acton, Massachusetts

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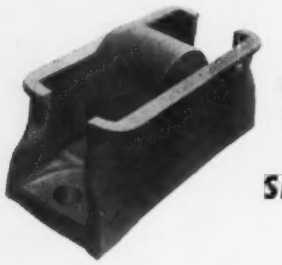

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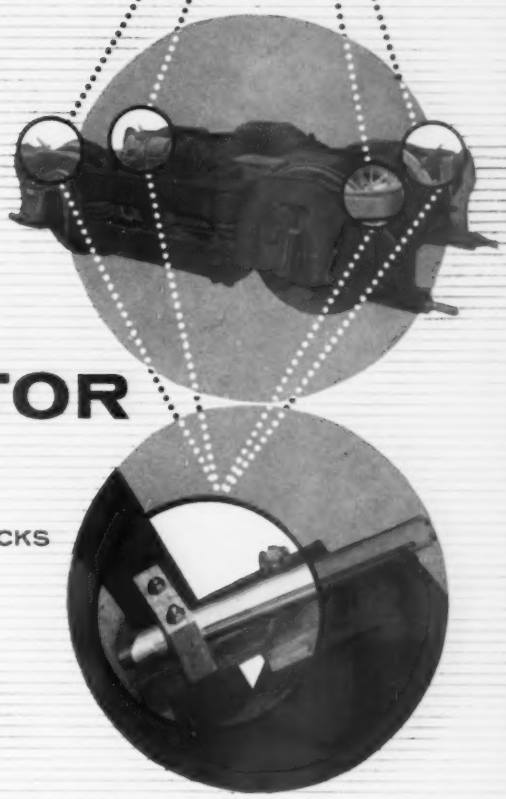

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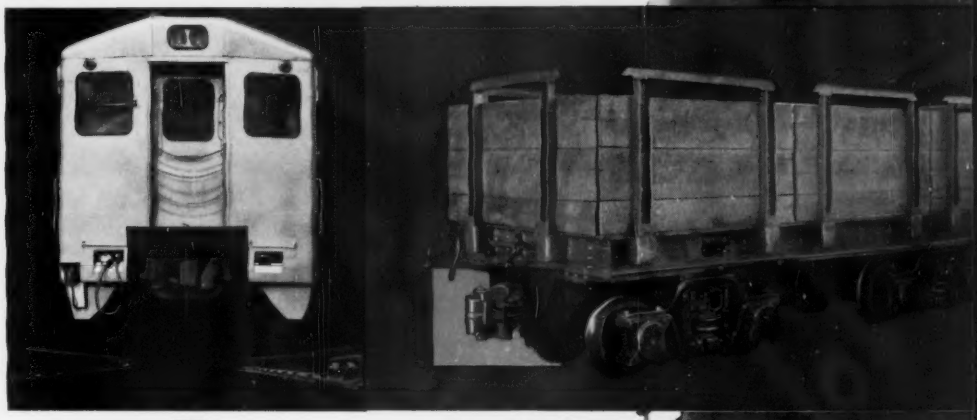

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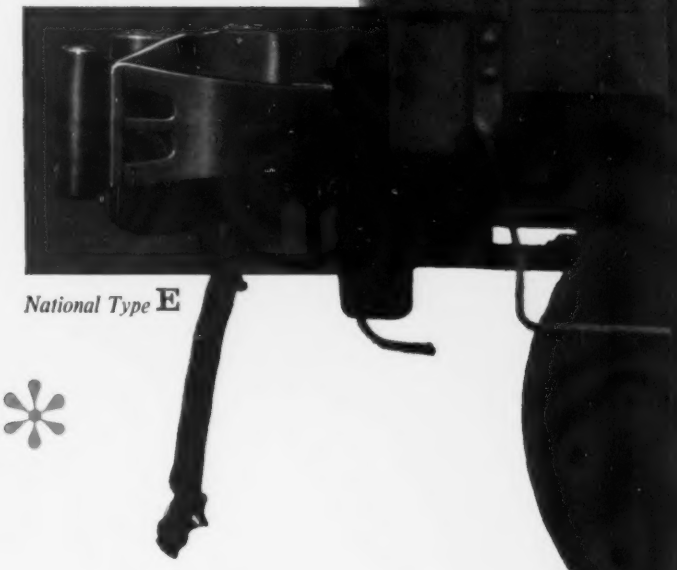

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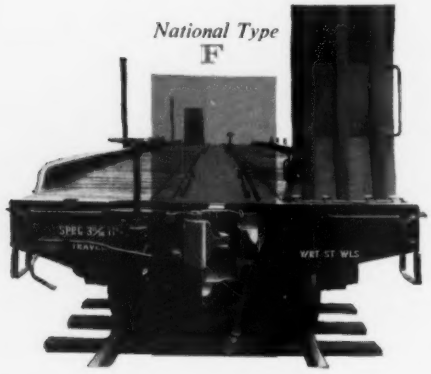

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